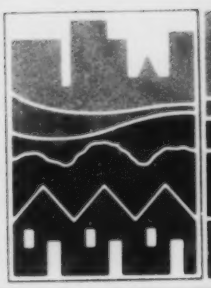
BIBLIOGRAPHICA ▫ 4

A SELECT, ANNOTATED BIBLIOGRAPHY ON SUSTAINABLE CITIES

Mary Ann Beavis and Jeffrey Patterson



INSTITUTE OF URBAN STUDIES

THE UNIVERSITY of WINNIPEG

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The Institute of Urban Studies is a multiple-function centre that undertakes to encourage, facilitate and engage in independent, multi-disciplinary research on a select range of topics (including sustainable urban development, the Western Canadian inner city, housing, Northern and Native issues, urban policy and municipal government, and social-demographic issues); to promote and engage in formal and informal education (including workshops, conferences, seminars, etc); and to conduct mission-oriented and applied research.

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Preface

The interest of the Institute of Urban Studies in urban sustainability goes back to 1989, when the Institute received funding from the Social Sciences and Humanities Research Council of Canada to hold a "Research Tutorial" on the ethical dimensions of sustainable development and urbanization. This resulted in a monthly series of seminars, held at The University of Winnipeg in the academic year 1989-90, with presentations from local academics on various aspects of this topic. The seminar was well attended by Winnipeg (and Brandon) academics, practitioners, government officials and students, and resulted in the IUS Publication *Ethical Dimensions of Sustainable Development and Urbanization* (1990). Since then, IUS has broadened and deepened its commitment to understanding the implications of the notion of sustainability for urban development. In 1991, a full-time, senior researcher was engaged to conduct research in this area, and in November of that year, a conference on Sustainable Housing and Urban Development was sponsored by the Institute. In December 1991, IUS launched a supplement to the *IUS Newsletter* (*Sustainable Cities*), featuring research underway on sustainable urban development at the Institute.

Back in 1989, the notion that cities might have a key role (or any role) in environmentally sound economic development was just beginning to be explored by urban theorists and environmentalists, and very few publications on the subject were available. Since that time, interest in "sustainable cities" and "green cities" has burgeoned; the fact that this bibliography contains some 400 items attests to the remarkable growth of interest in many different disciplines in the role of cities in sustainable development, and in how cities can be come more sustainable. And, as the "select" in the title suggests, although this bibliography is extensive, by no means does it encompass the entirety of the relevant literature, which continues to grow apace.

The documents cited below belong to a range of genres, disciplines and philosophical perspectives, and have been selected in order to be of use to various audiences: planners, academics, policymakers, educators, students, etc. Many, but by no means all, of the items are Canadian. The material has been classified according to seven main headings:

1. *Cities and Sustainability*, containing general works which attempt to articulate the role of cities in environmentally and economically sustainable development, or on how cities can become more sustainable;
2. *Visions of the Sustainable City*, made up of literature that depicts what a sustainable city would be like;

3. *Issues in Urban Sustainability*, organized under 22 subheadings, with information on environmental, economic, political and technical topics relevant to urban sustainability;
4. *The State of Urban Sustainability*, comprised of reports on the status of sustainable development in various cities (Canada and international);
5. *Plans and Strategies for Sustainable Cities*, listing sustainable development plans and programs implemented (or proposed) in various municipalities;
6. *Sustainable Communities*, a sampler of literature relevant to the related topic of building sustainable communities (neighbourhoods, towns, villages, suburbs);
7. *Periodicals*, a selection of relevant journals and newsletters.

Most of the entries in the bibliography are from 50-200 words in length, depending on the size and scope of the reference. Some items were available to the authors only for a short time, and so may appear to have received "short shrift" relative to other annotations (Bill Mollison's massive tome *Permaculture* is a good example). Other items were brief or pointed enough to be summarized in a sentence or two. It is hoped that readers will be able to glean enough from the entries to determine whether or not to obtain a given document.

Naturally, there are many cases where entries could easily be listed under more than one heading or subheading. To compensate for this, and to aid users to find relevant entries quickly and conveniently, an extensive index of authors and subjects is included.

The authors hope that this bibliography will serve as a useful tool for urban academics and professionals.

Mary Ann Beavis
Acting Director
Institute of Urban Studies

Select, Annotated Bibliography on Sustainable Cities

1 Cities and Sustainability

1.1Beavis, Mary Ann, ed. *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990.

In the academic year 1989-1990, the Institute of Urban Studies sponsored a seminar series entitled "Sustainable Development and Urbanization: Ethical Dimensions." The seminar met on a monthly basis, and papers were presented by academics and professionals in a number of fields in which the ethics of sustainable development is relevant: geography, philosophy, planning, rural development and political studies. This seminar, partially funded by the Social Sciences and Humanities Research Council of Canada, sought to examine issues of environmental ethics with special reference to urban issues—an undertaking which is of growing relevance in our increasingly urbanized world. The meetings attracted a wide variety of academics, professionals and students. The papers in this collection were initially presented at the meetings of the seminar: "Assessing Sustainable Development in an Urban Context" by Susan Wismer; "Community Planning and Sustainable Urban Development" by Brijesh Mathur; "Sustainable Development and Recycling Policy" by Peter Miller; "The Rivers of Downtown Winnipeg: An Environmental Assessment" by Andy Lockery; "Sustainable Development and Urban Policy in Winnipeg" by Philip H. Wichern; "The Responsibility of Urban Dwellers to Foster Sustainable Rural Communities" by John Everitt, Robert Annis and Fred McGuinness. The collection also contains a paper by Joel Novek and Karen Kampen entitled "Hard Copies, Hard Choices: Paper Pollution in the Information Society." See also the individual entries on these papers in this bibliography.

1.2Beavis, Mary Ann, ed. *Colloquium on Sustainable Housing and Urban Development: Papers Presented (November 16, 1991)*. Occasional Paper 29. Winnipeg: Institute of Urban Studies, 1992.

The papers presented at this one-day Colloquium, sponsored by the Institute of Urban Studies, are: "The Origins of Sustainable Development and its Relation to Housing and Community Planning" by David D'Amour; "The Politics of Sustainable Urban Development Policy in Canada" by Phil Wichern; "The Relativity of Sustainability" by William Code; "The Regulatory Framework and the Development of Sustainable Housing and Communities: Can We Achieve 'Sustainable' Objectives with Our Current Planning Regulations?" by Julie Tasker-Brown; "Reconsidering the Dream: A Report on Research Undertaken regarding Contemporary Suburbia, with a View Towards a New Morphology" by Ian MacBurnie; and "Linking Affordable Housing and Environmental Protection: A New Framework for Sustainable Urban Development Policy" by Mark Roseland.

1.3Brown, Lester R. and Jodi L. Jacobson. *The Future of Urbanization: Facing the Ecological and Economic Constraints*. Worldwatch Paper 77. Washington, DC: Worldwatch Institute, May 1987.

This report describes the growth and role of cities and urbanization in the late twentieth century, and outlines the economic, social and environmental implications of urban growth, one of the dominant demographic trends of our time, in the areas of: urban energy needs; feeding cities; nutrient recycling; ecology and economics of city size; and seeking a rural-urban balance. Sustainable alternatives to current urban tendencies are identified.

1.4Canfield, Christopher, ed. *Ecocity Conference, 1990: Report of the First International Ecocity Conference, March 29-April 1, 1990*. Berkeley, CA: Urban

Ecology/Dorena Lake, OR: Cerro Gordo Town Forum, 1990.

This publication, which contains brief summaries of nearly 100 presentations, comprises the proceedings of the First International Ecocity Conference, held in Berkeley, California, March 29-April 1, 1990. A large number of the presentations will be of interest to those interested in sustainable urban development. Paolo Soleri, architect and philosopher and designer of Arcosanti, the first planned community incorporating ecocity principles from its inception, argues strongly for the need for densified urban living arrangements. Peter Berg, founder of the Planet Drum Foundation, makes a plea for governing cities with sustainable policies so that they may reverse their present decline and become beneficial partners in restoring their life places. Richard S. Levine, co-director of the Centre for Sustainable Cities (University of Kentucky, Lexington, KY) argues that moving in the direction of sustainable development does not assure its realization, and may only support the longevity of the unsustainable path. Frederick Hertz, a San Francisco land use lawyer, argues strongly for an overhaul of zoning regulations to achieve ecological goals. Peter Calthorpe, originator of the notion of the "pedestrian pocket," asserts that current suburban growth is generating mounting traffic congestion, diminishing affordable housing, receding open space and stressful social patterns. Carl Woestendiek, waste reduction planner for Seattle, Washington, summarizes that city's program to recycle 50% of household wastes by 1993. Mark Roseland outlines proposals of Vancouver's Task Force on Atmospheric Change for energy efficiency and growth management, designed to attack local causes of the global issue of atmospheric change. While the conference as a whole was dominated by participants from California, this probably reflects the state of the current "ecocity" and "bioregional" movements. Copies are available from Urban Ecology, P.O. Box 10144, Berkeley, CA 94709, U.S.A. ($6.95 U.S.).

1.5Crerar, Alistair D. "The Sustainable City." *Policy Options Politique* (March/mars 1989): 3-5.

In this brief but pungent article, Crerar, former chief executive officer of the Environment Council of Alberta, argues that, as a society, we have the knowledge and skill to make cities more sustainable (to "live lightly on the land"), but lack the will. Moving to sustainable cities would require, e.g., uniform taxation of urban land to make downtown living affordable, the transformation of the garbage problem into a recycling industry, and the tapping of "people power." An example of local empowerment from a destitute area of Karachi, Pakistan is used to show that the poorest of the poor can be enabled to provide *themselves* with what they most want and need (in this case, buried sewers), thereby making the city more pleasant—more sustainable. However, progress towards urban sustainability is too often blocked by the perceived cost and inconvenience of environment-friendly policies, while powerful vested interests conspire to maintain the *status quo*.

1.6*Forces: Le développement viable en milieu urbain/Sustainable Urban Development*, 95 (Automne 1991).

This issue of Montreal-based *Forces* magazine is devoted to articles on sustainable urban development. All articles are in both French and English.

1.7Gordon, David, ed. *Green Cities: Ecologically Sound Approaches to Urban Space*. Montreal: Black Rose, 1990.

This anthology, sponsored by the Pollution Probe Foundation, provides a variety of perspectives on the theme of green cities. The

book is organized in three parts: Part One: What is a Green City?; Part Two: Naturalization at Work; and Part Three: Effecting Change—Breaking the Barriers. The first Part contains articles which attempt to define the green (sustainable) city; Part Two provides case studies of urban "greening"; and Part Three provides examples where urban areas have become more sustainable through the efforts of the public. This collection highlights both the things that can be/are being done to improve urban environments worldwide, and the gap between twentieth century cities and the "green cities" envisioned in Part One.

1.8Paehlke, Robert. *Bucolic Myths: Towards a More Urbanist Environmentalism*. Toronto: Centre for Urban and Community Studies, 1986.

Writing before the catch-phrase "sustainable development" became current, Paehlke (Department of Political Science, Trent University) argues that the ideology of environmentalism has some affinities with the thought of urban theorists such as Lewis Mumford, Jane Jacobs and Paolo Soleri. While environmentalism has traditionally been associated with the countryside, environmentally sensitive urban development may make possible "a future which celebrates both great cities and pristine wilderness" (p. 5). Paehlke enumerates ten environmental advantages of urban densification: (1) since average industrial residential space per person downtown is lower than in other areas, residential energy use will be lower in downtown areas; (2) multiple dwellings, a feature of downtown, require less energy per unit area for heating and cooling; (3) urban birth rates are lower than rural births; (4) urban areas are conducive to energy-efficient forms of mass transit; (5) thoughtful urban design can reduce travel needs; (6) the option of "carlessness" become feasible for downtown dwellers; (7) cheaper recycling, re-use and repair are possible in urban settings; (8) air pollution can be reduced through less travel and instalment of pollution control devices; (9) hazardous waste treatment facilities may be advantageously sited in cities; (10) wilderness preservation is enhanced by concentrating the human population in urban areas. Paehlke, somewhat prophetically, concludes that urban ecology should rank higher on the environmentalist agenda.

1.9*Plan Canada*, 31:3 (1991). Theme Issue on Sustainable Development.

This theme issue of *Plan Canada* contains three articles on urban sustainability: "Sustainable Communities: Planning for the 21st Century" by William E. Rees and Mark Roseland; "Green Planning: Striving towards Sustainable Development in Ontario's Municipalities" by Ray Tomalty and Sue Hendler; and "Vers une planification écologistique pour des communautés durables" by Luc Danielse. The issue also contains a report on the Canadian Institute of Planners' Action Plan for Sustainable Development.

1.10Rees, William E. and Mark Roseland. "Sustainable Communities: Planning for the 21st Century." *Plan Canada*, 31:3 (1991): 15-26.

This paper, published in the "Sustainable Development" theme issue of *Plan Canada*, assesses and defines the term sustainable development as it applies to urban settings, arguing that Herman Daly's concept of "strong sustainability" must inform urban policy and practice. The authors identify and discuss sustainable urban development initiatives that have been proposed and implemented worldwide. The article includes a set of useful tables which summarize strategies for sustainable cities under the headings of: Efficient Use of Urban Space: Transportation Planning and Traffic Management Initiatives; Efficient Use of Urban Space: Land Use Planning and Housing Initiatives; Reducing Consumption of Resources:

Energy Conservation and Efficiency Initiatives; Reducing Consumption of Resources: Waste Reduction and Recycling Initiatives; Improving Community Livability; and Administration for Sustainability. The article also contains a useful list of bibliographical references.

1.11**United Nations Centre for Human Settlements (Habitat).** *Human Settlements and Sustainable Development: The Role of Human Settlements and of Human Settlement Policies in Meeting Development Goals and in Addressing the Issues of Sustainability at Global and Local Levels*. Nairobi: UNCHS, 1990.

A global overview of the relevance of sustainable development to human settlements. The document points out that often "sustainability" overshadows "development"—defined in terms of meeting basic human needs—in explications of the concept. The focus here is on unmet needs in cities—for shelter, clean water, sanitation and drainage, garbage collection, transport and energy—and on their human and environmental implications. The inappropriateness of applying Western notions of "development" to Third World contexts is recognized. The relationship between human settlements and natural resource consumption, and the impact of settlements on global life-support systems, especially the global climate, is surveyed. Planning and policy measures to meet sustainable development challenges in human settlements are suggested.

1.12**United Nations Centre for Human Settlements (Habitat).** *People, Settlements, Environment and Development*. Nairobi: UNCHS, 1991.

Summarizing the results of an intergovernmental meeting held at The Hague, The Netherlands, in November 1990, this report contains the official submission of the Centre for Human Settlements to the Conference on the Environment and Development, scheduled to be held in Brazil in June 1992. The report contains special sections on water supply policies, sanitation and wastewater management, solid waste management, sustainable energy systems, transport policies reflecting sustainable development principles, and construction sector policies for sustainable human settlements development. Separate priorities for developed and developing countries, especially the burden on developed countries to reduce resource use, as well as provide advice to developing countries, are formulated.

1.13**Waterloo, University of, School of Urban and Regional Planning.** *Green Cities: Visioning a More Livable Habitat*. Waterloo: Faculty of Environmental Studies, University of Waterloo, 1991.

This report contains the six papers and discussion summary from a one-day conference on the concept of sustainable cities held in Spring 1991.

1.14*Winter Cities*, 9,2 (October 1991).

A theme issue on "Environment," featuring articles on sustainable housing for cold climates, energy management, community-based Northern sustainable development initiatives, recycling in winter cities and air pollution in winter cities.

1.15**Wismer, Susan.** "Autonomy, Responsibility, Self-Reliance: Assessing Sustainable Development in an Urban Context." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 5-17.

Much of the recent work on sustainable development has been conceptual or policy-oriented. Very little work has been done to date on evaluation of on-the-ground activities. What has taken place has been mostly in developing

countries and/or in rural locations. There is a need to develop a framework for the evaluation of sustainable development initiatives within an urban Canadian context. This paper is an exploration of what the dimensions of that framework might be, with particular reference to values, principles, policies, goals and relevant measures. (Abstract provided by the author).

1.16**World Commission on Environment and Development.** "The Urban Challenge." In *Our Common Future*. Oxford: University Press, 1987, pp. 235-58.

According to this chapter in the report of the Brundtland Commission, "The future will be predominantly urban, and the most immediate environmental concerns of most people will be urban ones" (p. 255). By the year 2000, almost half of the world's population will live in urban areas. The chapter deals mostly with the development needs of Third World cities, on the optimistic supposition that the governments of industrialized nations have the resources to revitalize their cities.

1.17**Yesney, Michelle.** "The Sustainable City: A Revolution in Urban Evolution." *Western City* (March 1990): 4-9.

This article, by the Director of the Office of Environmental Management for the City of San Jose, CA, explains how the concept of sustainable development applies to cities, discusses specific measures that can be taken to implement sustainable development, and outlines the environmental and economic benefits that can accrue to the sustainable city. The article is organized under three main headings: (1) Conserving the natural environment (energy and water conservation; toxic materials and water pollution control; urban forest, land and food resources); (2) Conserving the built environment (maintenance of infrastructure; recycling; improved transportation networks); (3) Reshaping the built environment (containing urban sprawl; inter-municipal co-operation; development of effective mass transit; downtown redevelopment; mixed-use developing; locating housing near jobs). Helpful examples of sustainable development measures that have been used in southern California municipalities are liberally provided. Yesney concludes that, far from being foreign to the traditional concerns of municipal governments—promoting health, safety and economic prosperity—sustainable development is a framework essential to achieving healthy and economically viable communities.

2 Visions of the Sustainable City

2.1**Callenbach, Ernest**. *Ecotopia*. Toronto/New York/London/Sydney: Bantam Books, 1977.

This is an "alternative future" novel (set in the 1980s!) in the Utopian tradition, which describes a new country formed by Western separatists who have broken away from the United States. The new nation (formerly Northern California, Oregon and Washington), whose top political leaders are ecofeminists, is an environmentally sustainable, urban-based culture, described in considerable detail by the narrator, an American investigative reporter from New York. An interesting "vision" of the sustainable city and society.

2.2*City Magazine*, 11,1 (Summer/Fall 1989). Theme Issue on Green Cities.

This issue of *City Magazine* features an introduction to the "Green City" concept in the form of a report on a Green Cities Conference held in Chicago (pp. 16-23), as well as articles on "Urban Land Use and Acid Rain" (Terry Fowler), "Green Urban Transport" (Jeff Lowe), "G.R.E.E.N. Products" (Nancy Birks), as well as reviews of books on environmental issues. This issue is a good introduction to some of the more "radical" approaches to planning for environmentally sustainable communities, including bioregionalism, ecofeminism and social ecology.

2.3*Edges: New Planetary Patterns*, 3,4 (1991).

This issue of *Edges*, a magazine published by the Canadian Institute of Cultural Affairs (Toronto), is subtitled "Ecocity and Beyond." Feature articles are: "Urban Imagination" by Sohail Inayatullah; "Saving Urban America from Itself" by Sam Smith; "Local Voices in City Politics" by Jim Troxel; and "Healthy Cities Project" by Trevor Hancock. The articles advocate urban cultural diversity and creativity, social equity and local empowerment, and ecologically sensitive ways of conceiving city life. Smith's visionary article on urban transformation is especially stimulating. Other topics addressed in this issue are indigenous architecture, urban gardening and community housing rehabilitation in the inner city.

2.4"Green Vision." *Architect's Journal*, 183,6 (1986): 38-50.

A brief account of the work and thought of four visionaries of the "city green" movement. Holland's Louis Le Roy is an anarchist whose concept of the "wild garden" challenges traditional planning and landscape architecture. Hermann Barges of Berlin uses analogies from nature to understand cityscapes, and to design buildings and open spaces on ecological principles to conserve natural resources. David Goode, then senior ecologist for the Greater London Council, has undertaken to restore natural habitats in derelict spaces. Jack Flanagan, a former Bronx, N.Y. police officer, is co-founder of the Bronx Frontier Development Corporation, which has created and facilitated community garden projects in the South Bronx.

2.5**Higgins, Sandra.** "Old Visions, New Twist." *Architect's Journal*, 183,6 (1986): 30-36.

A brief history of British urban greening initiatives, from the people's parks of the 1840s, to model company towns (Bourneville, Port Sunlight), Howard's garden cities, and 20th century new towns. The "green city" movement of the '80s, Higgins notes, differs fundamentally from previous approaches in that it is pro-city and recognizes that the city is part of nature, unlike earlier movements that deplored the evils of city life, regarding it as "unnatural."

2.6**Nicholson-Lord, David.** *The Greening of the Cities*. London/New York: Routledge & Kegan Paul, 1987.

The author is a London *Times* journalist with expertise in environmental issues. The majority of the research for the book was done during a three-month press fellowship at Wolfson College, Cambridge, sponsored by British Petroleum. Four other organizations, including the Royal Society for Nature Conservation and the Think Green campaign, supported the book. This intriguing study draws extensively on the British experience of the "greening" of cities, both on a large and small scale, since the 1970s, arguing that in order to promote human health, physical, psychological, spiritual and social, and a healthy environment, nature must be integrated into the urban fabric as much, and as intimately, as possible. He agrees with most advocates of sustainable development that local, citizen empowerment is essential, but his contention that policies of urban containment are misguided goes against the grain of much current thought on sustainable cities. Surprisingly, the idea that cities should be allowed to spread through multinucleation ("throwing off colonies" like the Greek *polis*) is not incompatible with deep ecology, since cities that provided enough nature, subsistence and variety for their inhabitants would, theoretically, feel less need to seek (and despoil) "the country" for agriculture and recreation. Nicholson-Lord offers a wealth of material on the history of cities, planning and landscape architecture, as well as from the history of culture and ideas, in support of his views.

2.7 **Robinson, John, *et al.*** "Defining a Sustainable Society: Values, Principles and Definitions." *Alternatives*, 17,2 (July/August 1990): 36-46.

This article summarizes some of the changes in approach and emphasis that must occur as sustainability succeeds conservation as a focus for environmental thinking. Conservation emphasized local actions. Three strategies for supporting ecological sustainability are described: (1) protection of life support systems; (2) protection and enhancement of biodiversity; and (3) resource management strategies aimed at enhancing the integrity of ecosystems.

3 Issues in Urban Sustainability

3.1Agriculture

3.1.1Britz, Richard, et al. *The Edible City Resource Manual*. Los Altos, CA: William Kaufmann, Inc., 1981.

A comprehensive introduction to urban farming, including case studies of U.S. city neighbourhoods that have instituted agricultural programs.

3.1.2Faulk, J.H. "The Primary Productivity of Lawns in a Temperate Environment." *Journal of Applied Ecology*, 17 (1980): 689-96.

The annual net primary activity of two lawns was compared: one was fertilized, irrigated and cut weekly. The other was neither fertilized, nor irrigated, and it was infrequently cut. Species richness in the well-maintained lawn was lower, although their level of primary productivity in both lawns was similar, and comparable to such grasses as maize and wheat.

3.1.3Lewis, Charles A. "Plants and People in the Inner City." *Planning*, 49,3 (1979): 10-14.

Lewis, an advisor for gardening activities in public housing projects and other low-income areas, describes some of the benefits of urban gardening with reference to community gardens in inner city New York, Philadelphia and Chicago. Lewis observes that participation in community gardening can enhance the psychological, social, economic and physical well-being of inner city residents, providing them with opportunities for recreation, social interaction, learning and improved nutrition. In addition, urban gardens enhance the inner city aesthetically, and have manifold ecological benefits.

3.1.4Ontario Public Interest Research Group. *The Growing City: A Guide to Urban Community Gardening in Toronto*. Toronto, 1986.

As the title suggests, this is a practical guide for Torontonians wishing to start and maintain an urban community garden. Environmental considerations, zoning, financial arrangements, gardening techniques and other resources are covered.

3.1.5Sommers, Larry. *The Community Garden Book: New Directions for Creating and Managing Neighbourhood Food Gardens in Your Town*. Burlington, VT: Gardens for All/The National Association for Gardening, 1984.

The benefits of community gardening are: a sense of ownership; economic benefits; personal satisfaction; enhanced sense of community; and environmental benefits. This book is a manual for individuals and groups wishing to establish a community garden, with information on sponsoring organizations and planning, fund raising and budgeting, getting and keeping land, site design, organically healthy soils, problem-solving and innovative approaches to urban gardening (e.g., community orchards, nurseries, greenhouses).

3.2Air Quality

3.2.1Canada, Department of Environment, Conservation and Protection. *National Urban Air Quality Trends, 1974 to 1985*. Ottawa: Environmental Protection Publications, Report EPS 7/UP/2, May 1987.

This annual publication indicates aggregate trends in air quality for 34 locations in 18 cities, and aggregate index of air quality trends for each of the locations. Data for the three largest Prairie cities are for a downtown and residential location, and there is one data collection point in Regina. For Winnipeg, the data indicate that the residential air quality collection point is one of

eight in Canada that regularly indicates good air quality. The index, like others throughout Canada, was about half its 1980 level in 1985. The downtown air quality index shows a "fair" rating similar to most of the collection points across Canada, but poorer than any other location in urban centres on the Prairies and considerably closer to peak levels recorded around 1980. In 1980 the downtown location recorded the poorest air quality in Canada.

3.2.2Manitoba, Department of Environment and Workplace, Safety and Health. *Manitoba Ambient Air Quality, Annual Report*. Winnipeg: Manitoba Environment and Workplace Safety and Health, Air Standard and Studies Section, Environmental Management Services Branch, various years.

This annual report summarizes air quality by pollutant by month. Two collection points, one downtown and the other in a residential location, are maintained in Winnipeg. The downtown location regularly reports only "fair" quality. Disaggregated data by pollutant indicate that particulate matter—mostly blowing "dust," not unwanted gases—is responsible for this low rating, which other reports indicate is only at par with air quality in other large urban centres. The residential location regularly shows "good" aggregate index of air quality.

3.3*Climate*

3.3.1Bouwman, A.F. "Land Use Related Sources of Greenhouse Gases: Present Emissions and Possible Future Trends." *Land Use Policy*, 7,2: 154-64.

This article is useful in documenting the relative magnitude of the more common greenhouse gases stemming from biotic, the natural carbon cycle and fossil fuel sources.

3.3.2Canada, House of Commons, Standing Committee on Environment. *Out of Balance: The Risks of Irreversible Climate Change*. Ottawa: House of Commons Canada, March 1991.

This report, Part III of the "Our Changing Atmosphere" Series, contains one of the most authoritative, and at same time balanced, reviews of the magnitude of the challenge presented by global warming, as well as the ways and means of mitigating it. In Chapter 1, Basic Issues, the Committee concludes that global warming is real and serious, that the impact of several greenhouse gases needs to be addressed, and that climatic change is a serious economic and social issue, as well as an environmental one. In Chapter 2, Policy Considerations, the Committee concludes that Canada's enviable international reputation on environmental issues is threatened by an apparent reluctance to act on CO_2 emissions. In Chapter 3, Targets for Emission Reductions, the Committee compares and contrasts Canada's current short-term targets with those of some other major developed countries, while in Chapter 4 the Committee discusses the ways and means to achieve various targets. Chapter 5 includes a discussion of possible developments after the year 2000, including the enactment of carbon taxes, alternative energy technologies and the role of nuclear energy in reducing greenhouse gas emissions.

3.3.3Gilbert, Richard. *Activities Related to the Prevention of Climatic Change in some Major Urban Areas of North America*. Working Papers Series 3. Toronto: Canadian Urban Institute, 1991.

This paper surveys policies (or lack thereof) for preventing global warming in five North American cities: Chicago, Los Angeles, Montreal, New York and Toronto. Such policies are vital, since, as the author observes, in order to prevent further global warming, *per*

capita emissions in industrialized countries must be cut by 90% (40% in LDCs) after 2005, *if*, by that time, overall CO_2 emissions have been cut to 1988 levels (p. 4). If present trends continue, however, the following results will ensue: saltwater inundation of coastal settlements; damage to infrastructure; over-stressed public transit; inappropriate energy infrastructure; mass unemployment (due to dislocation of our automobile-based economy); ecological refugees; and food shortages. Of the five urban centres surveyed, only Los Angeles and Toronto have policies in place to curb CO_2 emissions significantly. In the case of Los Angeles, strict emission controls have been necessitated by "the worst urban environment in the United States" (p. 8), and the environmental benefits of pollution control there are countered by lack of concern for urban regional form. The City of Toronto Council has committed the City to a 20% reduction in CO_2 emissions by 2005. A variety of recommendations to help achieve the proposed reduction have been formulated by the City's Special Advisory Committee on the environment: restructuring the local electricity distribution utility; intervention in the activities of the private natural gas distribution company; denser, more variegated urban form; expand district heating and introduce district cooling; reduce energy used in public and private buildings; aggressively favour public transit over other vehicles; extensive tree planting. It remains to be seen whether these recommendations will be implemented. The author concludes, interestingly, that energy-efficient and environmentally responsible large cities are probably "an essential form of settlement to accommodate the world's billions of people while preventing further global warming" (p. 17).

3.3.4Grubb, Michael. *The Greenhouse Effect: Negotiating Targets*. London: Energy and Environmental Programme, Royal Institute for International Affairs.

The author sets forth the view that across-the-board negotiations of carbon reductions are doomed to failure, as emissions per unit of GNP vary by a factor of ten. Alternative courses of action, including a carbon tax, carbon fuel production targets and marketable emission permits, are suggested.

3.3.5Guy, Neil K. "Cracks in the Montreal Protocol." *Alternatives*, 18,1 (1991): 11-13.

Despite agreement in June 1990 to halve the production of CFCs and halons over the period of a decade, the author asserts that half as many CFCs may be produced in the period 1990-2000 as were manufactured from the mid-1930s to 1990. The Intergovernmental Panel on Climate Change working group has estimated that CFCs, HCFCs and HFCs contribute 24% of the global warming caused by anthropogenic gases. Some models suggest that CFCs and HFCs have up to 10,000 and 2500 times, respectively, the warming potential of CO_2.

3.3.6International Energy Association. *Greenhouse Gas Emissions: The Energy Dimension*. Paris: Organisation for Economic Cooperation and Development, 1991.

This policy-oriented study begins to examine the contribution of greenhouse gases from energy-related sources, the projected growth of emissions to the year 2005, the technologies that can be utilized to control and reduce these emissions in both the near and long term, and policy options for limiting emissions from the energy sector.

3.3.7Lilley, John, and Calvin Webb. *Climate Warming? Exploring the Answers*. Edmonton: Environment Council of Alberta, November 1990.

The result of relatively thorough research and analysis, this document provides a good summary of the potential impact of global

warming on the Canadian Prairie provinces, both its advantages and disadvantages, as well as on the world as a whole. The authors conclude that while global warming is not a threat to human habitation of Earth as we have come to know it, this is no reason to be complacent. Both mitigating and adaptive strategies for global warming are suggested. Economic instruments in pursuit of the adaptive strategies are also suggested. The appendix contains excellent references section for those interested in pursuing the impact of global warming on the Prairies in particular.

3.3.8MacNeill, Jim. "The Warning of Global Warming." *Public Policy*, 11,9 (November 1990): 2-5.

The author, a former director of the environment for the OECD and later secretary general to the Brundtland Commission, stresses both the possibility and the urgency of limiting global warming by entering into conventions with small numbers of other advanced countries with targets for CO_2 reductions. He sees this as necessary to prevent global warming from becoming the crisis forecast by doomsayers, and as possible in light of the fact that 25% of the world's population consumes 70% of the world's hydrocarbons. In citing the urgency of such action the author recounts that the world's population has increased by 3x since 1900, its economies, 20x, consumption of its fossil fuels, 30x, and its industrial production, 50x. Two-thirds of these increases occurred between 1950 and 1990. By 2010, the world's population will double, and economic activity will have to increase 15x to 20x to satisfy the minimal expectations of the world's larger population. In arguing that it is possible to "have it both ways," the author cites the experience of Japan from 1973 to 1985. Its GNP increased by 80%, but its consumption of hydrocarbons decreased by one third.

3.3.9Schneider, T. *Studies in Environmental Science 35: Atmosphere Ozone Research and Its Policy Implications*. Amsterdam: Elsevier, 1989.

The author attempts to discern fact from fiction with respect to damage occurring, or potential future damage to the ozone layer. Two distinct problems are differentiated: (1) depletion of ozone in the stratosphere; and (2) increased ozone in the troposphere. He concludes that political judgments on control policy will continue to be made in anticipation rather than in certainty.

3.3.10Schroeder, Paul and Lew Ladd. "Slowing the Increase of Atmospheric Carbon Dioxide: A Biological Approach." *Climatic Change*, 19,3 (October 1991): 283-90.

Addressing the problem of how to decrease long-term atmospheric build-up of greenhouse gases, the authors conclude that reforestation targeted to creating carbon sinks should be looked upon as one means among many of reducing CO_2 concentrations. About 192 million ha of new Douglas Fir growth would store U.S. emissions for a 50-year incremental period.

3.3.11Simmons, Michael. "Canada's Greenhouse: A Dream Come True." *Plan Canada*, 26,5 (1986): 122, 123, 138.

Projections of climatic changes and their physiological impact on different parts of Canada are summarized from the report, *Understanding CO_2 and Climate*. While climate will on the whole be drier, cities such as Richmond, B.C. and large parts of P.E.I. will be flooded, most of Canada will be warmer, and heating costs may be 45% less on average. Evidence indicates a 40 year time lag in response to CO_2 levels. Even if levels were reduced immediately, there is a high probability that forecast global warming would occur in any event.

3.3.12Titus, James G. "Strategies for Adapting to the Greenhouse Effect." *Journal of the American Planning Association*, 56,3 (1990): 311-23.

Increasing concentrations of CO_2 and other gases seem likely to warm the earth in the next century. This article examines opportunities to prepare for the consequences, and focuses on options that are rational, even if one is sceptical about global warming. The merits of deferring action on the greenhouse effect until its consequences are proven must be weighed against the relative ease of reaching a consensus on a prudent course of action.

3.3.13Toronto, City of. *Evaluating the Role of the Automobile: A Municipal Strategy*. Toronto: City of Toronto and Technical Work Group on Traffic Calming and Vehicle Emission Reduction, 1991.

This report serves as an excellent data resource regarding specific atmospheric emissions and the rationale underlying various targets and dates for reducing them. It proposes a Canadian strategy that would require targets to be met by a combination of improvements in vehicle performance and a shift in modal split towards public transit and/or walking and bicycling.

3.3.14Vancouver, City of. *Clouds of Change: Final Report of the City of Vancouver on Atmospheric Change*. 2 Vols. Vancouver: City of Vancouver Planning Department, June 1990.

Considered a landmark report by some, this two-volume report, adopted by Vancouver's City Council, deals extensively with the reality of atmospheric change and its consequences, especially for port cities. The processes of ozone depletion and acid rain are examined, including extensive reference to local by-laws in the U.S.A., reproduced in Volume 2. The report contains 35 recommendations, starting with reducing emissions of atmospheric pollutants and including specific roles for the three levels of government. The report makes reference to "proximity planning" and adjusting land use relationships as part of the process of reducing travel demand and resultant poisonous emissions. Decentralizing employment and ensuring that residential densities allow cost-efficient public transit are two concerns.

3.4*Design*

3.4.1Hough, Michael. *City Form and Natural Process: Towards a New Urban Vernacular*. London & Sydney: Croom Helm, 1984.

Toronto-based consultant Michael Hough explains natural processes, the effects on them of urbanization, and shows how ecologically based urban design can better integrate nature and the city. The topics covered are:

- Climate: the effect of cities on climate; the role of urban plant life in climate amelioration and pollution control (the issue of global climate change is not discussed);
- Water: urban water pollution; alternatives to water-borne urban sewage (use of land or aquatic plants as a filter);
- Plants: naturalization and functionalization of urban open space, including urban forestry and ecology parks, urban grazing;
- Wildlife: encouraging urban wildlife (especially bird species) by preserving, restoring and creating habitats.
- City Farming: use of urban open space (parks, industrial sites, vacant lots) for intensive agriculture.

Examples from Canada and abroad are furnished.

3.4.2McHarg, Ian L. *Design with Nature*. Garden City, NY: The Natural History Press, 1969.

This book, by a planner and landscape architect, is an eloquent argument for urban design in harmony with ecological principles. One of the first advocates of urban ecology, McHarg calls for the recognition of nature in the metropolis, describes environmentally informed land use planning, urban design grounded in natural forms and environmental values, and a synergistic concept of urban health—anticipating the Healthy Cities movement (and bioregionalism) by more than a decade! This book, as Lewis Mumford prophesied in the Introduction, has become a classic in urban ecology, and contains many insights fundamental to urban sustainability: "This is not a book to be hastily read and dropped; it is rather a book to live with, to absorb slowly, and to return to, as one's own experience and knowledge increases" (p. viii).

3.4.3Mollison, Bill. *Permaculture: A Designer's Manual*. Tyalgum, Australia: Tagari Publications, 1988.

A lengthy (576 pages) and comprehensive guide to the practice of "permaculture" ("permanent agriculture"), a bioregionally sensitive approach to design and development which includes community development strategies.

3.4.4Todd, John and George Tukel. *Reinhabiting Cities and Towns: Designing for Sustainability*. San Francisco: Planet Drum Foundation, 1981.

This short book advances patterns in nature, particularly the principles of biological succession, as a model for urban design and development. Biogeography and local culture should inform bioregionally based design. Specific design suggestions with respect to urban water use, housing, food production, transportation and community energy systems are offered.

3.4.5Todd, Nancy Jack and John Todd. *Bioshelters, Ocean Arks, City Farming: Ecology as the Basis of Design*. San Francisco: Sierra Club, 1984.

Written by the founders of the "New Alchemy," this book is a fascinating account of how biological/ecological principles can be applied to the design of buildings, human settlements and societies. The authors suggest nine principles which should guide design: (1) the living world is the matrix for all design; (2) design should follow, not oppose, the laws of life; (3) biological equity must determine design; (4) design must reflect bioregionality; (5) projects should be based on renewable energy sources: (6) design should be sustainable through the integration of living systems; (7) design should be coevolutionary with the natural world; (8) building and design should help heal the planet; (9) design should follow a "sacred ecology." A chapter on redesigning existing communities covers the topics of history and bioregion, purification and recycling, soil, working with existing structures, the synthesis of biology and architecture, urban agriculture strategies and transportation, power and new shapes of employment. Concrete examples of designs that have worked (on a limited scale) are provided. The book also contains a chapter on sustainable agriculture.

3.4.6Wann, David. *Biologic: Environmental Protection by Design*. Boulder, CO: Johnson Books, 1990.

The author, an employee of the U.S. Environmental Protection Agency, argues for a new environmental ethic based on "design with nature" principles. Natural systems are used as

models for design, rather than as obstacles to be overcome. Wann describes a wide variety of design alternatives, from spray bottles to household wastewater treatment systems.

3.5*Ecology*

3.5.1Bornkamm, R. ed. *Urban Ecology: The Second European Ecological Symposium, Berlin, 8-12 September 1980.* Oxford: Blackwell Scientific Publications, 1982.

A collection of scientific, technical papers on various aspects of urban ecology. Papers are arranged under the following headings: I. Urban Ecosystems and their Constitution; II. Ecological Effects of Human Activity in Urban Areas; III. The Acquisition and Application of Ecological Knowledge in the Urban Environment. Includes articles on "Ecological contributions to urban planning" and "The teaching of urban ecology to future teachers."

3.5.2Dawe, Gerald F.M., ed. *The Urban Environment: A Sourcebook for the 1990s.* Birmingham, UK: Centre for Urban Ecology, 1990.

Intended primarily for urban ecologists, this annotated bibliography contains over 1100 entries, mostly abstracts from articles from 1980 to 1987 in some 40 journals. Inclusion of articles from numerous local journals in Britain makes this resource especially valuable to those interested in the British literature. Focus is on items dealing with animals, plants and other biota in cities, chemical and physical aspects of ecology and the natural ecological processes that occur in cities.

3.5.3Douglas, Ian. *The Urban Environment.* London: Edward Arnold, 1983.

The book, by the Professor of Physical Geography at the University of Manchester, is "a plea for involvement of earth and biological science information in our thinking about cities" (p. 202). Douglas argues for an inter-disciplinary approach to urban studies, which integrates data from the sciences, the social sciences and the humanities. His chapter headings indicate the scope of this detailed and comprehensive work: "The city as a economic system and as an ecosystem"; "The city as a dependent system: food supply, raw materials and their environmental impact"; "The energy balance of the city"; "The mass balance of the city"; "The geomorphology of the city"; "The biogeography of the city"; "The disposal of surplus and waste materials from the city"; "The geographical aspects of urban health and disease"; "Managing and planning the city to reduce environmental hazards"; and "People, government and the ecological future of cities." Examples are drawn from urban centres worldwide. The book provides a fine overview of the ecological/biological, technological and social aspects that must be taken into account in the modern quest for urban sustainability.

3.5.4Newby, Howard. "Ecology, Amenity and Society." *Town Planning Review*, 61.1 (1990): 3-20.

This article assesses the potential contribution of the social sciences to the study of global environmental change. Recent environmental concerns mark a shift from amenity-led to an ecology-led approach to environmental sustainability. The author puts forward a case for an inter-disciplinary approach to the new field of study.

3.5.5Toronto, City of. *Environmental Backgrounder: Environmental Planning Issues and Concerns in the City of Toronto.* Toronto: City of Toronto Planning and Development Department, December 1990.

This volume provides a lay synopsis of the environmental concepts, concerns and issues

relevant within the Toronto urban setting. It describes a simplified scientific background to assist the public in understanding the nature, cause and significance of environmental problems that relate to the quality and quantity of land, air and water resources.

3.6*Economics*

3.6.1Bruekman, Jan K. "Growth Controls and Land Values in an Open City." *Land Economics*, 66,3 (1990): 237-48.

This article challenges the classical economic model of the impact of growth controls on land and housing prices, which assumes that the market value of housing increases and the market value of vacant land decreases relative to a free market situation with no controls. An econometric model is developed which differentiates the effects of growth controls through time and leading up to development. Towards the time of development the price of vacant land increases relative to its market value in the absence of controls.

3.6.2Carlin, Alan. *Environmental Investments: The Cost of a Clean Environment—A Summary.* Washington, DC: Environmental Protection Agency, Office of Policy, Planning and Evaluation, EPA-230-12-90-84, December 1990.

This comprehensive technical review of the impact of environmental protection regulations contains detailed data on the projected capital and operating costs of meeting 1987 regulations, as well as on the impact of those regulations to date. Estimates are that total public costs will increase from 2.1 to 2.8% of GDP. There are no estimates of private costs. Data for 1984 show the following progress in meeting regulations relative to 1970 air pollution levels: particulate matter, 30%; SO_2, 58%; NO_x, 72%; VOC, 60%; CO, 43%; and Pb, 3%.

3.6.3Cole, H.S.D. *et al.*, eds. *Thinking About the Future: A Critique of "The Limits to Growth."* Sussex, UK: Sussex University Press, 1973.

The most significant contribution of this anthology, whose editors and authors claim that they are not attempting to encourage complacency by criticizing the dynamic models of growth developed by Forrester and Meadows, is that models of future developments should not be accepted uncritically. A secondary contribution is that humanity and the political system may well alter development in such a way that critical stages in future development may be avoided. The first part of this two-part volume is devoted to a critique of the world dynamic models and their sub-systems: population; natural resources; capital; and pollution. The major focus of critique is on model assumptions, data used in the models and the exponential nature of the model equations. With respect to the interaction of the subsystem models, the authors note that the pollution model is irrelevant to the total model, as limits to the world's natural resources cause system collapse long before critical pollution levels are reached. However, when resource parameters are given more optimistic values, the pollution sub-system becomes the critical factor in system collapse. The second part of this reader examines the ideological background to the world models, including the values of Malthus and other economists, the historical problems in population forecasting, the contribution of environmentalism to the climate of acceptance of the models and the significance of the technocratic nature of the models.

3.6.4Community Environmental Council. *The Bottom Line: Restructuring for Sustainability.* Santa Barbara, CA: Community Environment Council, 1991.

Informed by the work of Amory Lovins and Roger Sant, this policy document prescribes a "least cost" strategy for bringing about a

sustainable society. This approach is extended to such areas as transportation and water demand management.

3.6.5Daly, Herman E. and John B. Cobb, Jr. *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future*. Boston: Beacon, 1989.

This book, written by World Bank economist Herman Daly and theologian John Cobb, became an instant classic of sustainable development when it was published only a few years ago. The book is an incisive critique of the discipline of economics, and the concept of economic development. Economists, they argue, have mistaken economic models for reality ("the fallacy of misplaced concreteness"). Contemporary economics has completely overlooked the *essential* environmental basis of economies, leading to the present situation, where economic development is in reality deterioration insofar as it depletes and undermines the natural resource base. Daly and Cobb argue that human (community) and environmental values must inform sustainable development, which they distinguish from "cancerous" economic growth. The book contains a brief section on urban habitat (264-67), in which they use Paolo Soleri's arcology as a possible scenario for a sustainable city form.

3.6.6Morehouse, Ward, ed. *Building Sustainable Communities: Tools and Concepts for Self-Reliant Economic Change*. New York: The Bootstrap Press, 1989.

This book is severely critical of contemporary economics and economic institutions. A series of articles by C. George Benello, Robert Swann and Shann Turnbull introduces alternative approaches to economics and development: Community Land Trusts and Land Banks; Community Self-Management; and Community Currency and Banking. Based on the Schumacher Society Seminars on Community Economic Transformation.

3.6.7Pearce, David *et al.* *Blueprint for a Green Economy*. London: Earthscan Publications, 1989.

Originally prepared for the UK Department of the Environment, this report reviews ways and means by which natural wealth may be incorporated into standard accounting practices.

3.7*Energy*

3.7.1Bleviss, D.L. and P. Walzer. "Energy for Motor Vehicles." *Scientific American*, 263,3 (September 1990): 102-109.

The differential impact of innovation subsequent to the first oil-price shock in 1973 in Europe and North America and consumption trends are identified, as are potential conservation measures in the future. In their discussion of split amongst future transport modes the authors draw attention to the ability of van pools to provide efficiency nearly identical to public transit and flexibility similar to the automobile, as well as to the potential results of encouraging greater bicycle use.

3.7.2Brown, M.A. and S.M. Macey. "Evaluating the Impact of Two Energy Conservation Programmes in a Midwestern City." *Applied Geography*, 5 (1985): 39-53.

One of the Canadian findings of this study was that the impact of the Canada Home Insulation Program was lessened by the fact that some consumers used the savings resulting from insulation as a rationale to consume more heating fuel.

3.7.3Burchell, Robert W. and David Listokin, eds. *Energy and Land Use*. Piscataway, NJ: Center for Urban Policy Research, 1982.

More or less coinciding with the second "oil price shock," the issues and ways in which this volume addressed the relationship between land use and energy conservation continues to make it relevant. Beginning with the tension between loss of valued amenities and the energy advantages of recentralization of cities, it is noted that energy use, central city decline, environmental degradation, fiscal insolvency, excessive loss of agricultural land and the need for increased housing assistance must be addressed simultaneously. Both "hard" and "soft" means of addressing the need for energy conservation are described. Several authors, including Anthony Downs, stress the need to address energy conservation without expecting behavioral or settlement system changes.

3.7.4Danish Ministry of Energy. *Energy 2000: A Plan of Action for Sustainable Development.* Copenhagen: Danish Energy Agency, April 1990.

Inspired by the Brundtland Commission report, this is Denmark's ambitious action plan oriented towards achieving sustainable development in energy matters, with the overall aim of reducing the CO_2 emissions of the Danish energy sector by 20%, and SO_2 and NO_x emissions from the 1988 levels, by 2005. By 2005, Danish energy consumption would decrease by almost 15%. Four main areas of action are targeted: savings in energy consumption (e.g., through energy taxes and regulation); conversion of the supply system to achieve greater efficiency (e.g.. cogeneration of heat and electricity); increased use of cleaner (non-nuclear) energy sources (e.g., biomass, wind); and research and development. The report concludes that implementation will not place additional cost burdens on Danish society.

3.7.5Dostrovsky, Israel. "Chemical Fuels from the Sun." *Scientific American*, 265,6 (December 1991): 102-107.

This articles summarizes the state of scientific knowledge regarding progress in production of chemical fuels from sunlight, chiefly hydrogen made by electrolysis of water. The author asserts that the world's current demand for energy could be satisfied by solar rays falling on less than 0.1% of the Earth's surface, harvested with an efficiency of less than 10%, and he is critical of the International Energy Agency for allocating only 4% of its annual research budget to this process, while allocating over 60% to nuclear energy research.

3.7.6Dreyfus, Daniel and Anne B. Ashby. "Fueling Our Global Future." *Environment*, 32,4 (May 1990): 17-20, 36 ff.

The author provides future energy demand estimates by source to the year 2010 from OECD references. U.S.A. demand will decrease from over 26% of the world total in 1986 to 19% in 2010, reflecting in part a continuation of the trend from 1973 to 1983 that saw a decrease of 20% per dollar of GNP. On the other hand, the current trend is for less developed countries to use energy more intensely.

3.7.7Energy Task Force of the Urban Consortium, Energy, Environment and Economic Development Unit. *The Sustainable City Project: A Tri-City Collaboration for Developing and Implementing Sustainable Urban Energy Practices.* City of Portland Energy Office/City of San Francisco Bureau of Energy Conservation/City of San Jose Office of Environmental Management, August 1991.

A report on the results of a collaborative project undertaken by the cities of Portland, Oregon, and San Francisco and San Jose, California, to "identify, rank and implement energy policies and programs for promoting urban sustainability" (p. 2). The steps taken by each city towards sustainable urban energy use are described in chapter four of the report.

"Sustainability" is defined in terms of responsibility to future generations.

3.7.8**Hawkes, D. *et al.*** *Energy and Urban Built Form*. London: Butterworths, 1987.

The result of an international seminar featuring an emphasis on the construction of formal relationships (models) between built form and energy consumption, this book focuses on simulation, analysis and prediction of the energy use performance of groups of buildings, including city blocks and mixed-use developments, intermediate between individual buildings and the city.

3.7.9**Heisler, G.M.** "Energy Saving with Trees." *Journal of Aboriculture*, 12 (1986): 113-25.

This article describes the tree locations, types and size and their energy saving characteristics. A summary of research data suggests that proper tree sizes, types and location can result in energy savings of from 20-25% relative to an unshaded house.

3.7.10**Lang, Reg and Audrey Armour.** *New Directions in Municipal Energy Conservation*. Ontario: Ontario Ministry of Energy, 1980.

This is a report on energy conservation measures instituted in California municipalities in the 1970s, especially the city of Davis. The implications of the California experience for Ontario municipalities are drawn out. The authors conclude that energy programs should involve both the municipality and the local community, and that public support is vital.

3.7.11**Morris, David.** *Self-Reliant Cities: Energy and the Transformation of Urban America*. San Francisco: Sierra Club, 1982.

This study demonstrates how the twentieth century American city has been shaped by the automobile and electrification. Morris documents the role of the automobile in the suburbanization of America, and the loss of municipal control over electrical utilities. U.S. cities' loss of the right to self-government and fiscal autonomy, and the rise—and apparent failure—of city planning, are chronicled. As the cities have become less self-reliant, Morris observes, the demands on urban governments for social programs and infrastructure renewal have increased. Morris advocates the relocalization of energy production based on conservation and efficient technologies such as cogeneration and photovoltaics as a means of renewing municipal self-reliance. Writing in the wake of the "energy crisis" of the 1970s and the concomitant interest in energy conservation, Morris was overly optimistic when he predicted that the 1980s would see widespread reforms in energy technology and resource use, preparing the way for the "ecological city."

3.7.12**Nicol, Keith.** "Building Orientation and Heating Requirements in Canada." *Plan Canada*, 27.6 (1987): 154-61.

The developing wisdom among Canadian planners is that the best street orientation to reduce energy consumption is east-west streets with southward facing houses. Research also indicates that increased densities, an efficient transportation network and building characteristics may have a greater impact on level of energy consumption. The article also summarizes data on the impact of higher insulating standards on heating costs. The cost of heating a super-insulated prototypical house in Edmonton, Saskatoon and Winnipeg is $505, $468 and $491, respectively, compared with $705, $661 and $690 with the National Research Council's 1984 standards.

3.7.13**Owens, Susan.** *Energy, Planning and Urban Form*. New York, NY: Methuen, 1987.

This volume focuses primarily on the links

between urban form/spatial structure of cities and energy use. Owens recounts the possible effect of energy shortages and the consequent need to reduce energy consumption in urban form and transport, as well as in space heating.

3.7.14Poulson, M.F. and J. Forrest. "Correlates of Energy Use: Domestic Electricity Consumption in Sydney." *Environment and Planning*, 20 (1988): 327-38.

The role of income in domestic electricity consumption, compared with the influence of other socio-economic characteristics, has been a major issue of debate. Collinearity among independent variables has prevented conclusive analysis. Using data supplied by the Sydney County Council and data on the characteristics of households and dwellings by account area, the authors undertake sequential regression equations to overcome the usual limitations. The role of income is found to be less important than some studies suggest, and it is found that much of its influence is indirect. The import of these findings is a suggestion that policy focus shift to influencing consumer behaviour.

3.7.15Schoenauer, N. and S.C. Skoryna, eds. *EPROM '76: Environmental Protection and Energy Conservation*. Newboro, ON: Rideau Centre, Advanced Research Centre for Behavioral and Physical Sciences, 1976.

Organized on the occasion of the U.N. Conference on Human Settlements, 1976, this volume portrays the 10 winning entries from 139 submissions by students of architecture on conservation of natural resources in community design. Most of the winning entries make extensive use of active and passive solar heating.

3.7.16United Nations Centre for Human Settlements (Habitat). "Use of Energy by Households and in Construction and in Production of Building Materials." Report of the Executive Director (HS/C/13/7). *Habitat News*, 13,1 (1991): 8-12.

A summary of a UNCHS (Habitat) report by the same title. Part One of the report covers patterns of energy use by households in developing and developed countries, and suggests strategies for enhancing energy efficiency and reducing energy demands. Part Two covers energy use in the building materials and construction sectors, including pollution problems.

3.8*Environmental Impact Assessment/Indicators*

3.8.1Ateah, C. "Protecting Our Urban Environment: Environmental Impact Review and the City of Winnipeg." M.C.P. thesis, University of Manitoba, 1980.

Ateah describes the U.S. and Canadian policies with respect to Environmental Impact Assessment (EIA), and outlines the techniques of EIA available, in 1980. An interesting feature of the thesis is that it goes on to chart the rise and fall between 1972 and 1977 of Section 653 of the *City of Winnipeg Act*, which stipulated the first formal requirements for EIA on public projects in any municipality in Canada. Ateah concludes that the legislation was undermined by imprecise formulation, misunderstanding by City Council, opportunistic use by special interests, and by its abuse by pro- and anti-development Councillors.

3.8.2Domon, Gérald, Michel Gariépy et Peter Jacobs. "Développement viable en milieu urbain: vers une stratégie de gestion des interventions." *Plan Canada* (January 1992): 8-17.

The authors offer a definition of sustainable development based on: the satisfaction of the needs of present and future generations; equity, social justice and the maintenance of cultural diversity; the preservation of ecological

integrity. They propose a set of indicators, environmental, social, and economic, organized around these three principles, for the evaluation of planning initiatives. The Master Development Plan of Montreal's Central District is used as a case study. The Plan fails to address most of the indicators of urban sustainability identified by the authors, especially in the areas of health and safety of citizens, the satisfaction of basic needs, and basic environmental objectives.

3.8.3Gardner, Julia E., W.E. Rees and P. Boothroyd. "The Role of Environmental Assessment in Promoting Sustainable Development: Three Views." Vancouver: School of Community and Regional Planning, University of British Columbia, Discussion Paper 13. June 1988.

This discussion paper, which combines under one cover three smaller papers by the three authors, is aimed at improving the process and substance of environmental assessment and its contribution to the goal of sustainable development. All three observers seem in agreement that environmental assessment by itself, being project-based and being oriented towards selecting alternatives that do no more than minimize environmental harm, is not necessarily supportive of the larger goal. Julia Gardner outlines nine approaches to environmental assessment, planning and management, ranging from the narrow—ecological framework principles—to the comprehensive—impact zoning/regional carrying capacity and integrated resource management. William Rees begins with the observation that the World Commission on Environment and Development set forth conflicting prescriptions for the future. While asserting that current production and techniques present a threat to the planet's ability to sustain human life, they proposed that equity demanded a nine- or ten-fold increase in industrial production over the next century. Canada's own National Task Force on Environment and the Economy stepped to the right of the World Commission when it asserted that the sustainable development concept did not require the preservation of the current stock of natural resources. He concludes that cumulative assessment and carrying capacity provide powerful conceptual and practical tools for implementing sustainable development. Peter Boothroyd puts forward the concept of fair sustainable development and outlines changes in both the substance and process of environmental impact assessment required to support it. Process improvements require that environmental impact assessment become public, fair and interactive.

3.8.4Gosselin, Pierre, *et al.* *Feasibility Study on the Development of Indicators for a Sustainable Society*. Ottawa: Health Promotion Directorate, Health and Welfare Canada, May 9, 1990.

Growing out of a committee exercise aimed at providing Canadians and their decision-makers with a way to measure Canada's progress toward becoming a sustainable society, this report contains 20 indicators for equity and for sustainable development. Most of the indicators use already available data. Future suggestions for research and development of indicators are included.

3.8.5Jacobs, Peter and Barry Sadler, eds. *Sustainable Development and Environmental Assessment: Perspectives on Planning for a Sustainable Future*. Ottawa: Canadian Environmental Assessment Research Council, 1990.

Intended to address the call in the report of the World Commission on Environment and the Economy to strengthen the science and methodology of environmental assessment, the authors in this monograph address issues such as coping with uncertainty and risk in assessments, dealing with conflicts between interests, co-ordinating scientific analysis and public input,

and weighing facts and values.

3.8.6Organization for Economic Co-operation and Development. *Urban Environmental Indicators.* Paris: OECD, 1978.

Published by the OECD Environment Committee, this report develops a set of indicators, both objective and subjective, which relate to human quality-of-life in urban areas. The indicators are partially based on a survey, administered in 1975 in 19 cities in OECD countries (including Regina, Saskatchewan). Although it is recognized that social and cultural considerations would need to be taken into account in a truly comprehensive set of indicators, the indicators developed in this report claim to measure only physical environmental factors. The indicators relate to the environmental concerns of housing; services and employment; and ambient environment and nuisances. A summary of proposed indicators and detailed definitions for measurement are included (pp. 51-57). Case studies on the use of urban indicators in London, Stockholm and Zurich, and case studies on the development of urban indicators in Rouen, Indianapolis and Vienna, make up the last half of the report.

3.8.7Resource Futures International and Institute for Research on Public Policy. *1991 Environmental Scan: National and International Environmental Issues.* Winnipeg: Canadian Council of Ministers of the Environment, January 1991.

The intent of the authors is to document an issue agenda for the Canadian Council of Ministers of the Environment. Issues identified include environmental assessment, the need to establish an environmental auditor, the enactment of an environmental bill of rights, environment/economy integration, measuring ecological capital, and environmental reporting and indicators.

3.9Environmental Organizations

3.9.1Barber, John. "The Green Team." *West* (June 1991): 18-29.

This article in the *Globe and Mail's* Western Canadian magazine supplement rates 12 environmental organizations active in Canada in terms of radicalism and environmental value. Information on organizational structure, membership, finances and current activities is provided. Although not specifically urban in focus, this article gives valuable insights into the nature and orientation of some of the most prominent environmental activist organizations in the country.

3.9.2*The Green List: A Guide to Canadian Environmental Organizations and Agencies.* Ottawa: The Canadian Environmental Network, 1991.

This is the first edition of a comprehensive list (423 pages) of environmental organizations and agencies in Canada. The index contains a section on Urban Issues, and listings on other issues relevant to urban sustainability (e.g., Land Use Conflict, Hazardous Chemicals, Life Style, Transportation) are also included. Each entry lists the address and phone number of the organization, contacts, purpose of the organization, issues addressed, type of organization (e.g., NGO, governmental organization, Native organization), activities sponsored, and publications. An indispensable source on the environmental movement in Canada.

3.10Finance and Fiscal Impact

3.10.1Barbier, E.B. ***et al.*** "Environmental Sustainability and Cost-Benefit Analysis." *Environment and Planning*, 22,9 (1990): 1259-66.

Efforts to "operationalize" a concept of sustainability in appraisal methods designed to assist decision-making have been few and have generally not been persuasive. The author suggests that a set of environmentally compensating, or "shadow projects" may lead to more accurate third party costs from environmental damage. He asserts that the resulting optimum differs from that of conventional cost-benefit criterion, but the basic cost-benefit model remains in effect.

3.10.2Burchell, Robert W. and David Listokin. *Fiscal Studies for the Governor's Commission on Growth in the Chesapeake Bay Region.* Baltimore: Maryland Office of Planning, 1990.

A compendium of three separate studies: "Future Growth in the State of Maryland: The Scale, Capacity to Accommodate, and Costs of Trend Development (1990-2020);" "Capital Funding Alternatives to Support Future Growth: Revenue Sources and Their Potential for Revenue Generation;" and "Growth, Infrastructure Costs, Achievable Revenues, and Their Infrastructure-Revenue Gap: State of Maryland (1990-2020)." They concentrate on projecting residential and nonresidential growth, linking household and employment increases to the demand for physical space, and converting physical space demands into demand for and resultant consumption of raw land; the result is projections of capital costs to improve the land under trend and vision (sustainable) scenarios. Capital costs considered include roads, utilities, schools and other capital costs normally attributable to municipalities. The studies conclude that vision growth is less expensive than trend growth, and that the gap between required revenues and achievable revenues is therefore less under the vision scenario. It is suggested that the state might entice local governments to adopt local land use regulations leading to the vision scenario by providing additional funding to close the gap.

3.10.3Dekel, Gabriel P. "Regina Subdivision Densities: Cost/Revenue Analysis." Paper presented to annual conference workshop, Planning for Economic Reality, Canadian Institute of Planners, Toronto, 1988.

This paper results from the author's analysis of the overall fiscal impact on both municipal operating and capital costs of new suburban developments by assessment level in the City of Regina. The model quantifies the minimum housing densities required to maintain a balanced municipal budget.

3.10.4Hanley, N. *et al.* "Research Policy and Review 33: Why Is More Notice Not Taken of Economists' Prescriptions for the Control of Pollution?" *Environment and Planning*, 22 (1990): 1421-39.

The authors examine four classes of reasons why greater use of the price mechanism is not utilized: ignorance; theoretical problems; practical problems; and institutional or cultural factors. Their simplest conclusion is that environmentalists oppose pollution taxes because they are in fundamental disagreement with the principle of selling the right to pollute. Hence, they generally favour regulation even if it may not be as effective. The authors do, however, note a number of theoretical and practical problems in their discussion.

3.10.5Kain, John F. *Urban Form and the Costs of Services.* Cambridge, MA: Discussion Paper No. 6, MIT-Harvard Joint Center for Urban Studies, Harvard University Press, 1967.

Undertaken nearly a decade earlier than the landmark Real Estate Corporation Study, this review and analysis of the studies then existing on the relationship between servicing costs and urban form and urban density concluded that standards were the most important fact or in resulting servicing costs. Low density development might even be more economic to

the extent that it might be associated with low quality standards.

3.10.6Lower Mainland Regional Planning Board. *Economic Aspects of Urban Sprawl: A Technical Report.* Vancouver, BC: Lower Mainland Regional Planning Board, 1956.

One of the first Canadian studies to attempt to assess the costs and benefits of different municipal land users, this study concluded that farms paid 50% more taxes than service value received from municipal governments, while areas of suburban sprawl received 12% more in service value than taxes generated. The report recommends taxation relief for large farm holdings, the object of which would be to enable such holdings to pass directly from farm to dense urban use, bypassing wasteful low density development.

3.10.7Nelson, Arthur C. *et al.* "Symposium: Development Impact Fees." *Journal of the American Planning Association*, 54,1 (1988): 3-78.

This special series of articles describes the development and use of lot levies and special fees in the U.S.A. While the constitutional position and essentially court-imposed limits on "development impact fees" differs substantially from Canadian regimes, the development of fees in Canada and the U.S.A. appears to have followed similar paths. In his introduction, Nelson indicates that the per dwelling costs of providing water, sewerage, drainage, police, fire, library, school, park, recreation and other community facilities averages $20,000 in his Florida municipality. Historically, municipalities in the U.S.A. freely extended services into new subdivisions as recently as the 1920s. A new partnership and arrangements with subdivision developers emerged in the late 1940s, when local government authorities began requiring that land developers provide infrastructure services within their subdivisions, while the authority continued to extend services to the edges of subdivisions. Parks, school sites, etc. within subdivisions began to be required to be donated by the land developer. "Development impact fees" (lot levies) were gradually levied to pay the cost of extending services to the edges of subdivisions, and to pay for other facilities to serve dwellings in the new subdivisions. In the article, "Who Bears the Cost of Development Fees?", Forrest E. Huffman concludes with respect to the incidence of fees that consumers (home buyers) will pay the major share of development impact fees in the long term, as developers incorporate the costs into housing prices. In an article entitled "The Social Implications of Impact Fees," Charles E. Connerly concludes that to the extent that development impact fees raise housing prices, they are bad social policy. Impact fees also raise serious questions about the role of planners and the clients served in growing communities. It is asserted that, rather than serve the public at large, planners may tend to view developers who pay the fees as their clients.

3.10.8Owens, Susan. "Green Taxes." *Environment and Planning*, 22 (1990: 1417-19.

During the 1960s, and building upon the work of Pigou in the 1930s on welfare economics, it became accepted that externalities are pervasive. Use of Pigovian taxes to correct market imperfection received increasing support from economists through the 1960s. It was also generally perceived that the poor need not be disadvantaged as long as use of the price mechanism was judicious.

3.10.9Real Estate Research Corporation. *The Cost of Sprawl.* Washington, DC: U.S. Government Printing Office, Prepared for HUD, EPA and the Council on Environmental Quality, 1980.

Six prototypical communities were modelled.

The two low density communities differed in that one contained 75% clustered development and 25% low density sprawl development and the other contained the same development types, but in inverse proportion. The capital cost of providing the water supply network within a subdivision of 1000 homes on one acre lots was found to be 4.5 times the cost for the same number of homes developed at five units/acre. The cost of sanitary sewers was 3.5 times.

3.10.10Starr Group. *Metro Main Streets: Economic Feasibility Study*. Toronto: Metropolitan Planning and Economic Development Department, 1990.

Undertaken as part of the Municipality of Metropolitan Toronto's review of its official plan for the urban structure, this study examines the development potential of five prototypical sites on Metro's main streets. The schemes provide housing over ground-level retail uses. Using a LOTUS-based real estate computer model, the financial feasibility of various forms of tenure were determined. Non-profit rental and condominium development were found to be the most feasible. Private rental housing was not attractive except where development was for walk-up units and parking could be accommodated at grade. Recommendations for regulatory reform are also included.

3.11 *Forestry*

3.11.1Dry, R. "Problems Affecting Urban Trees in Quebec City." *Journal of Aboriculture*, 9 (1983): 167-69.

The results of a study of the problems of nearly 5,000 trees in the Quebec City region show that abiotic diseases are far more important and cause far greater damage than do biotic diseases.

3.11.2Dunster and Associates. *Establishing the Geraldton Community Forest: Phase I Concepts and Background Information*. Toronto: Conservation Council of Ontario, 1989.

This report, an executive summary of which is contained in *Ontario Conservation News* (Vol. 16, No. 10), sets forth the concept of community forest and defines the main principles inherent in the term and required for success. The report concludes by proposing that the Town of Geraldton, a Northern Ontario community concerned about the declining value of forestry resources in its vicinity, establish a community demonstration forest for the purpose of enhancing recreation and tourism, improving wildlife habitat, and establishing a facility for environmental education. The forest would provide a focus for introducing sustainable development into forest management and for integrated forest management for multiple outputs. Resources for staffing of the forest would come from limited logging of the forest. The Mission Tree Farm and the North Cowichan Municipal Forest in British Columbia, together with the county forests in central and Southern Ontario, are the only examples of community forests in Canada known to the authors.

3.11.3Jorgensen, Erik. *Urban Forestry: Some Problems and Proposals*. Toronto: Faculty of Forestry, University of Toronto, September 1967.

This paper, prepared for the Ninth Commonwealth Forestry Conference in 1968, is an appeal for foresters to consider urban settings as an appropriate focus for education, research and practice. The involvement of professional foresters in urban planting, Jorgensen argues, will result in more judicious and regionally appropriate selection of species, better planting procedures, and better survival rates for urban trees.

3.12*Form (Urban)*

3.12.1Audirac, Ivonne, Anne H. Shermyen and Marc T. Smith. "The Ideal Urban Form and Visions of the Good Life: Florida's Growth Management Dilemma." *Journal of the American Planning Association*, 56,4 (Autumn 1990): 470-82.

Florida's emerging urban development policy is aimed at solving the urgent problem of how to continue to grow in an environmentally responsible manner within a low tax climate. The state is attempting to redirect urban growth toward a more fiscally efficient and livable compact form, running counter to residential preference for low density life styles. It is argued in this article that there is too little empirical evidence to substantiate claims of economic and fiscal benefit of compact form, and definitional ambiguities haunt the literature on urban sprawl. While the environmental argument against sprawl appears convincing, a compact development policy oversimplifies environmental issues and may exacerbate environmental problems in existing urban areas. The authors conclude that if the environment is the real impetus to regulate urban form, then environmental planning based on the ecological characteristics of a region should dictate water and land use decisions and should determine where low density or compact development should occur. The authors also argue for the adoption of alternative pricing mechanisms over additional regulation.

3.12.2Bourne, Larry S. "Are New Urban Forms Emerging? Empirical Tests for Canadian Urban Areas." *Canadian Geographer*, 33,4 (1989): 312-28.

This paper, utilizing data from the 1971 and 1981 Censuses, tests five discrete but related hypotheses concerning the process of massive restructuring of the form of contemporary cities. The results confirm the hypothesis of a continued decentralization of housing and employment. A wider spatial mismatch between the distribution of jobs and labour force participants, primarily for inner city residents, is confirmed. Despite the rapid suburbanization of employment, there is little evidence that a distinct multi-nucleated urban form has yet emerged in Canada.

3.12.3Brotchie, J. *et al.*, eds. *The Future of Urban Form*. London: Croom Helm, 1985.

The papers in this volume were presented at a special meeting at the University of Waterloo (Ontario) convened by the International Council for Building Research Studies and Documentation in 1983. The overwhelming conclusion of the workshop is that continued advances in technological innovation in transport and communication will facilitate greater population dispersal. These tendencies have been and will be greatest in the United States and North America. The papers nevertheless show that national policies may have an impact on these trends. Examples are the differential impact on urban form and densities of housing and planning policies in the United States and Canada and the impact of intra-urban transport policies in Europe in continuing to differentiate North American and European urban form.

3.12.4Comay Planning Consultants *et al.* *A Study of Sprawl in New Brunswick*. Toronto: Comay Planning Consultants Ltd., 1980.

Rising costs of serving new residential development appear to be related to sprawl and low density development. A substantial part of the report is also devoted to rural residential development. It is found that locational choice is based primarily on environmental rationale. The authors doubt that this demand can be eliminated by providing financial disincentives, although the report emphasizes that government's willingness to provide infrastructure contributes substantially to

demand. The report recommends the preparation of framework plans for rural residential development in rural areas.

3.12.5Duany, Andres. "Rethinking Suburban Sprawl—Planning Compact, Traditional Neighbourhoods." Video. Toronto: Centre for Urban and Community Studies, 1991.

Videotape of an illustrated lecture on neotraditional urban projects, delivered by architect-planner Duany, designer, with partner Elizabeth Plater-Zyberk, of the town of Seaside, Florida. The lecture was co-sponsored by the Ontario Ministry of Housing and the Centre for Urban and Community Studies. Copies are available from the Centre, which is located at the University of Toronto, 455 Spadina Avenue, Rm. 426, Toronto, ON M5S 2G8.

3.12.6Fishman, Robert. *Bourgeois Utopias: The Rise and Fall of Suburbia*. New York: Basic Books, 1987.

This volume seeks to explain the powerful cultural ideal, labelled "bourgeois utopia," of suburbs in British and North American societies. Aspects addressed include the origin of suburbs in industrial cities, the evolution of the suburban auto-oriented city of the late twentieth century, labelled the "technoburb," and the role of family, the middle class and nature in spawning loyalty to the suburban ideal. British and North American developments are contrasted with those in continental Europe.

3.12.7Fowler, Edmund P. *Building Cities That Work*. Montreal: McGill-Queen's University Press, 1992.

Fowler argues that North American urban development since 1945 has been inordinately expensive, and ecologically and socially disastrous. Fowler uses 19 neighbourhoods in Toronto as case studies to test Jane Jacobs' hypothesis that physical diversity in a city has a positive impact on social and economic life. A rethinking of values must inform the reorganization of communities on an ecologically viable scale.

3.12.8Garreau, Joel. *Edge Cities: Life on the New Frontier*. New York: Doubleday, 1991.

This popularly oriented volume reviews nine recently developed suburban office complexes in the suburbs of major American cities, including the background underlying their receipt of planning approval.

3.12.9Goldberg, M.A. and J. Mercer. *The Myth of the North American City: Continentalism Challenged*. Vancouver: University of British Columbia Press, 1986.

The authors use case studies to criticize narrowly economistic explanations of urban form. They argue that American and Canadian cities are products of different political cultures and public policies. Political as much as economic differences account for differences in urban form. Canadians are less individualistic and more accepting of government intervention. The Canadian banking system has been far more supportive of urban development. Canadian cities are more compact; they have a more balanced mix of public and private transportation systems; and their inner cities are healthier, as indicated by a high incidence in the inner city of family households and lower levels of income disparity between the inner city and the suburbs.

3.12.10Gordon, P. and H.L. Wong. "The Costs of Urban Sprawl: Some New Evidence." *Environment and Planning A*, 17 (1985): 661-66.

Based on empirical evidence that the largest metropolitan areas have the largest proportion of non-central city work trip-ends, the authors associate a variety of work-trip results for such cities with a polycentric urban form hypothesis.

They also claim that the results of their simulation also suggest that decentralized settlement is not necessarily uneconomical. As well, increasing vehicle occupancy may absorb effects of increased travel demand.

3.12.11**Ontario, Office of the Greater Toronto Area.** *GTA 2021—The Challenge of Our Future*. Toronto: Government of Ontario, Office of the Greater Toronto Area, n.d. (c. 1992).

Published in Winter 1992, this working document incorporates the response to the study, *Greater Toronto Area Urban Structure Concepts Study*, as well as the principles of the *Watershed* report by the Royal Commission on the Future of the Toronto Waterfront. It sets forth Ontario's goals for the future development of the GTA region, including the untenability of further urban sprawl, public support for concentrated, nodal development within the urban envelope, a better balance between housing and employment, and increased use of public transit. It concludes with a proposal to develop a consensus around a strategic development plan by 1994.

3.12.12**Ottawa-Carleton Regional Planning Department.** *Opportunities for Residential Intensification in Ottawa-Carleton*. Ottawa: Regional Municipality of Ottawa-Carleton, September 1990.

This report identifies rising land consumption in each quinquennial period since 1961, summarizes data on net densities in other jurisdictions, and analyses opportunities for intensification within Ottawa-Carleton, concluding that between 1990 and 2010, some 24,500 dwelling units can be provided on greenfield lands within the greenbelt, and that about 16,500 of these can be built in areas already considered developed. It also describes a City of Ottawa program for replacing combined sanitary-storm sewers over a 35 year period, which will assist in making intensification possible.

3.12.13**Peiser, Richard B.** "Density and Urban Sprawl." *Land Economics*, 65,3 (1989): 193-204.

Arguing that strict land development policies aimed at limiting urban sprawl, defined within as "the lack of continuity in expansion", may in fact have the effect of reducing developed densities on the urban fringe, the author explores the alternative hypothesis that permitting "leap-frog" development may result in higher final urban densities. The hypothesis is tested in three U.S. cities with the conclusion that the argument holds if and only if municipal land development practices result in designation of higher densities on infill sites.

3.12.14**Rowe, Peter.** *Making a Middle Landscape*. Cambridge, MA: MIT Press, 1991.

This very probing volume, based on studies in Boston and Houston, USA, is aimed as much at understanding the attractions of suburban life as in criticizing it: personal freedom; increased access to home ownership; easy auto accessibility; and soft landscapes, concluding with design criteria for a new landscape that might be characterized as a middle one, neither urban nor suburban as we know it today.

3.13*Housing*

3.13.1**Bellan, Ruben C., Commissioner.** *Report and Recommendations of the Winnipeg Land Prices Commission*. Winnipeg: Queen's Printer, July 18, 1977.

A significant contribution of this report is its observation that planning and development control on "spaceship earth" are required to be tighter and more firmly applied than in the past, but that one potential cost of stricter control is

escalation in land and housing prices. The report notes the tightening of the land development process since the creation of "Unicity" in 1972, as well as the uniform and stricter servicing requirements. Its recommendations focus on the ways and means of maintaining a flow of new building lots into the market, while simultaneously fostering more orderly development of the urban fringe.

3.13.2Blaesser, Brian W. *et al.* *Advocating Affordable Housing in New Hampshire: The Amicus Curae Brief of the American Planning Association in Wayne Britton v. Town of Chester*. Washington, DC: American Planning Association, 1990.

Submitted to the Supreme Court of New Hampshire by a committee of solicitors appointed by the American Planning Association, this brief probably contributed substantially to a decision by the subject court to invalidate the entire zoning by-law of the Town of Chester, a suburb of Manchester. The brief may be of interest to Canadian planners in that it sets forth the background of planning law resulting in exclusionary zoning, the standard mechanisms used to implement exclusionary zoning, and a quite exhaustive history of efforts aimed at invalidating or overcoming exclusionary zoning by-laws throughout the American states. For those interested in the relationship between zoning by-laws and land use planning and the natural environment, it is noteworthy that challenges to exclusionary zoning have not been based on principles of sustainable development, since, as in Canada, the right to housing in the U.S.A., does not exist in law. Progressive jurisdictions have moderated total local control over planning and zoning by enacting legislative provisions that bind the exercise of local government authority to legislative directive. Equity and social criteria, not the environment or an interest in sustainable development, have formed the core of such legislative guidelines or directives. The brief makes reference to a potential conflict between the interests of sustainable development and the need for affordable housing when it cites "overuse of the environmental defense" as one of the rationales frequently used by municipalities to justify exclusionary zoning by-laws.

3.13.3Calgary, City of. *Single-Detached Infill Housing Guidelines for Established Communities*. Calgary: City of Calgary Planning and Building Department, March 1988.

Intended for application in established and inner city communities, the importance of these guidelines is that they establish design criteria for approval of infill housing applications on substandard (small) lots. As in the case of virtually every other Canadian municipality, the City of Calgary has not approved infill guidelines for single family districts that comprise most of the city.

3.13.4Canada Mortgage and Housing Corporation (CMHC). *CMHC Activities which Address Environmental Concerns*. Ottawa, August 1990.

This 9-page document (with French translation) points out the relevance of human settlements and housing to sustainable development, and lists CMHC activities relating to environmental issues. In addition to participation in a number of national and international governmental bodies with an interest in sustainable urban development and sustainable housing, CMHC is undertaking research on housing, energy and the environment, housing on toxic lands and radon gas emissions.

3.13.5Canada Mortgage and Housing Corporation. *CMHC's Healthy Housing Design Competition: Guide and Technical Requirements*. Ottawa: CMHC, 1991.

While comprising only a guide to the criteria that are intended to be used for a national demonstration program on sustainable housing, the criteria are useful in identifying all of the issues relevant to the application of the principles of sustainable development to new housing. Criteria in five areas—occupant health, energy efficiency, resource efficiency, environmental responsibility, and affordability and economic viability are identified. Technical requirements in each of the five areas are identified as well.

3.13.6Coleman, A. *Utopia on Trial: Vision and Reality in Planned Housing*. London: Hilary Shipman, 1985.

Resulting from detailed studies of local environments containing over 100,000 dwellings, this comprehensive evaluation of housing design documents the relationship between social malaise and design attributes. Design features and differences of modern housing estates were mapped and tested to see which were associated with dysfunctional social behaviour by residents and neighbours. The study has profound implications for the design of open spaces in and around contemporary housing projects.

3.13.7D'Amour, David. *Sustainable Development and Housing*. Research Paper No. 1. Ottawa: Canada Mortgage and Housing Corporation, 1991.

This is a background paper, preliminary to more detailed work on sustainable housing. This paper sketches the historical antecedents of the current environmental crisis, and outlines modern initiatives to counteract environmental degradation. Issues in sustainable community planning and housing are introduced; in particular, the relevance of urban development and housing to global climate change are discussed. Issues specifically related to housing are identified, including energy efficiency, water use, household waste, renovation and demolition waste, and broader urban development issues (e.g., land use, infrastructure, transportation, urban runoff). The author advocates a planning process more informed by ecocentric, as opposed to technocentric, values.

3.13.8Farralones Institute. *The Integral Urban House: Self-Reliant Living in the City*. San Francisco: Sierra Club, 1979.

Essays on a "design with nature" approach to urban-style housing, which seeks to integrate housing with natural processes, in order to meet the basic human needs of food, uncontaminated water, waste management, protection from weather, and freedom from pests and disease. The goal of integral design, which includes energy and resource conservation, use of solar energy (including food production) and wildlife management, is household self-reliance in an urban context. Based on a prototype built in Berkeley, CA.

3.13.9Frieden, Bernard J. "Housing Development is Stifled by Environmental, Growth Control Legislation." *Journal of Housing*, 38,1 (1981): 25-32.

The author asserts that environment and growth controls have laid a particularly heavy cost burden on California home buyers; moreover, they have produced few environmental benefits for the public at large. The new regulations might be desirable if they resulted in denser use of parcels remaining from past development approvals. Environmental groups usually frown on denser use of left-over urban sites, as such sites are often the "lungs" for the immediately adjoining residential development areas. He also suggests that controls should be loosened, as both the marketplace, as well as social research, suggest that most Americans find the suburbs desirable places to live.

3.13.10Goetz, Edward. "Office Housing Linkage in San Francisco." *Journal of the American Planning Association*, 55,1 (1990): 66-77.

The objective of OHPP (Office Housing Production Program) was to mitigate housing demand generated by office space growth. Its financial burden was quite small, roughly 1.2% of development costs. Nevertheless, linkage is not likely to become widespread, as success is associated with presence of certain political and economic factors—strong office market coupled with an aggressive, usually community-based advocacy for linkage.

3.13.11Metropolitan Toronto Planning Department. *Housing Intensification*. Toronto: Municipality of Metropolitan Toronto, Planning Department, 1987.

Prepared as part of Metropolitan Toronto's review of its official plan, this background document provides a good understanding of the planning and demographic arguments in favour of intensification, as well as full explanations of the methods available: redevelopment (including re-urbanization), infill and conversion.

3.13.12Miller, Thomas I. "Must Growth Restriction Eliminate Moderate-Priced Housing?" *Journal of the American Planning Association*, 52,3 (1986): 319-25.

Comparing changes in growth policies and resulting housing output in two communities in Colorado and California, the author concludes that researchers have been too quick to blame growth controls for the scarcity of moderate-priced housing. In Boulder, Colorado, the price of new single-family housing increased after the city enacted its growth limitation ordinance, but such housing subsequently represented a minority of housing opportunities. The market for small, affordable attached units flourished in Boulder.

3.13.13Ontario Ministry of Housing. *Sustainable Development and Housing*. Toronto: Ontario Ministry of Housing, June 27, 1991.

This background paper relates the concept of sustainable development to housing and urban development. The following housing strategies related to sustainable development are identified: residential intensification; affordable housing; use of government land; infrastructure; and energy initiatives. The paper concludes by discussing both the environmental benefits and the risks (e.g., increased land and housing prices, public resistance to intensification and affordable housing, additional costs of supplying energy-efficient housing) associated with implementing sustainable housing and urban development.

3.13.14Robinson, Terry. *Sustainable Housing for a Cold Environment*. Ottawa: Canada Mortgage and Housing Corporation, January 1991.

Presented at Winter Cities Forum '91, this paper summarizes two years of examination by the Canada Mortgage and Housing Corporation on how housing can be made more sustainable. In addition to impact on air, water and land, the inquiry is reported to have focused on energy resources, including energy embodied in building materials, affordability, indoor pollution, and the sustainability of neighbourhoods and communities, including climatic suitability, enhancement of existing communities and reforming the regulatory process and influencing consumer attitudes.

3.13.15Solomon, Arthur P. *The Effect of Land Use and Environmental Controls on Housing*. Cambridge, MA: Joint Center for Urban Studies of the Massachusetts Institute of Technology and Harvard University, Working Paper No. 34, February 1976.

In one of the first reviews of the thesis that

the trend towards greater environmental controls over land development was resulting in increased land prices, the author concludes that this impact cannot be reasonably attributed to the new generation of controls. He cites the fact that 70% to 80% of land in Standard Metropolitan Statistical Areas (SMSAs—the U.S. equivalent to Canadian Census Metropolitan Areas [CMAs]) is vacant as the most valid argument against the thesis. He concludes that stricter control is more likely to affect the amount of land consumed for new dwellings. He also concludes that the new generation of controls and their stricter application by local governmental authorities, combined with increased energy prices, may have the effect of redistributing land costs and land development opportunities. He also concludes that the new interest in controls could intentionally or unintentionally have a negative impact on the housing opportunities of less affluent sectors of society and of poor people.

3.13.16Stokes, Bruce. "Recycled Housing." *Environment*, 21,1 (1979): 6-14.

This article discusses the "housing phenomenon of the 'seventies"—recycling housing through restoration and preservation. (The author, writing in the U.S. during the Carter administration in 1979, optimistically expected this trend to accelerate; unfortunately, the current housing crisis in the U.S. belies this hope). The present generation's penchant for buying ready-built new homes, and the policy of providing public housing for the poor, Stokes observes, are novelties; traditionally, self-construction, conservation, repair and renovation have been the norm. Private housing development and public housing have some deleterious social and environmental consequences: inflated land values, ghettoization of the poor, energy inefficiency, use of synthetic rather than natural materials, unaesthetic environments. Stokes provides examples where urban homesteading and self-help housing have emerged worldwide as a counterpoise to these modern housing ills. Governments should take the following steps to encourage recycled ("sustainable") housing: ensure the legal right to land use; provide funds for construction and long-term financing; limit land speculation and tax increases on renovated homes; reform inappropriate housing standards; regard housing policy as an *adjunct to* environmental policy.

3.13.17Vaz, Angelina. "The Advanced House." *Women and Environments*, 13,2 (1991): 51.

This is a brief, but incisive, review of the Advanced House, a prototype for environmentally responsible and aesthetically pleasing housing sponsored by Energy, Mines and Resources Canada, the Ontario Ministry of Energy, Ontario Hydro and the Ontario Home Builders Association. Located in Brampton, Ontario, the house features an Integrated Mechanical System (IMS), which functions as a combined furnace, water heater, air conditioner and ventilation system, airtight construction, energy-efficient windows, compact-fluorescent lighting, blown cellulose insulation, contra-flow fireplace, energy-saving appliances and a two-storey passive solar sun room. This technology results in a $785 annual energy bill, compared with $2,862 for a similar, conventionally built house. The author notes that although the technology is impressive, the house is wasteful in other ways: it cost almost a million dollars to design, although the sponsors have no intention of duplicating this "prototype" for prospective buyers; the house is excessively large (1000 m^2); the house is located far from public transit; it shows no sign of environmentally sensitive landscaping; and the market price of $500,000 indicates that the inhabitants would not live low on the energy scale. She concludes that the Advanced House conveys the harmful message that high technology, rather than significant lifestyle changes, are the key to environmentally benign housing.

3.13.18Weninger, Jane M. "Providing Affordable Housing on Contaminated Land in Ontario." *Canadian Housing*, 7,2 (1990): 24-31.

In some urban areas, the only sites available for the development of affordable housing are on industrially contaminated land. The author outlines methods for determining whether a site is contaminated, and describes clean-up methods. The case study of Ataratiri, a mixed-use redevelopment (subsequently abandoned by the Ontario government) on land formerly committed to a variety of industrial uses in downtown Toronto, is presented. Projects such as this, Weninger suggests, will "provide leadership and set new standards for the redevelopment of contaminated land for public- and private-sector development" (p. 31). Unfortunately, she does not address the question of why only "affordable housing" (housing for low-income individuals and families) is deemed appropriate for contaminated land, and what industry's role in clean-up should be.

3.14*Landscape Architecture*

3.14.1Alterman, R. and S. Amir. "Neighbourhood Physical Form and Use Of Public Open Spaces: Haifa, Israel." *Landscape Research*, 2: 145-54.

Reporting on empirical research undertaken in Israel, this paper explores the relationship between land use and building density and size and use of public, outdoor open space. The findings did not show a close relationship between residential environment density and a tendency for greater open space use. However, the location of the open space in did seem to bear a relationship to the volume of use.

3.14.2Givoni, B. "Impact of Planted Areas on Urban Environmental Quality: A Review." *Atmospheric Environment, Part B: Urban Atmosphere*, 25B,3 (1991): 289-300.

This article summarizes several studies on the impact of plants on indoor temperatures and heating and air conditioning loads and costs. Examples include a reduction in temperature of an exterior wall in Florida by 13.5-15.5° C following tree planting, reduction of temperature of another exterior wall by 10-12° following the planting of vines and the decrease in the air conditioning load of a mobile home from 5.56 kWh to 2.28 kWh following landscaping.

3.14.3Hough, Michael. *Out of Place: Restoring Identity to the Regional Landscape*. New Haven/London: Yale University Press, 1990.

Toronto landscape architect Hough documents the loss of environmental and cultural integrity that has resulted from the globalization of urban design and landscape conventions. He recommends principles for environmentally and culturally sensitive regional design, which include knowing the place, maintaining a sense of history, environmental learning and direct experience, "doing as little as possible," sustainability, and "starting where it's easiest."

3.14.4Ruff, Allan R. and Robert Tregay. *An Ecological Approach to Urban Landscape Design*. Occasional Paper 8. Manchester: Department of Town and Country Planning, University of Manchester, 1982.

The essays in this paper are proceedings of a Workshop held in Warrington New Town (U.K.) in 1981. The papers, contributed by a variety of (mostly) British landscape architects, environmental scientists and related professionals, are arranged under three headings: Philosophy; Techniques; and Community and the Landscape. An interesting paper by Roland Gustavsson (pp. 119-35), a landscape architect from the Agricultural College of Sweden, describes "nature-like" landscaping implemented in Swedish housing developments.

3.14.5Vancouver, Urban Landscape Task Force.

Urban Landscape Ideas Paper. Vancouver: City of Vancouver, City Manager, March 5, 1992.

Having made a significant contribution to Canadian "green" urban planning with the report of the Task Force on Atmospheric Change, Vancouver appointed a second group to examine the urban landscape. This first report of the task force encompasses virtually the entire green planning agenda, including bicycle and pedestrian transportation, ecology, water, neighbourhood planning, and "densification" and constitutes a beginning in the formulation of a comprehensive plan for the City of Vancouver.

3.14.6Wilson, Alexander. *The Culture of Nature: North American Landscape from Disney to the Exxon Valdez*. Toronto: Between The Lines, 1991.

This book, by a Toronto landscape designer, is a fascinating study of how modern, North American culture has shaped our view of (non-human) "nature" as a fund of "natural resources," as a recreational amenity, as a form of entertainment, as a source of nostalgia, as a fund of scientific data. The author argues that our conception of the relations between city and country, culture and nature has fostered environmental degradation and human alienation from the land.

3.15*Nature in Cities*

3.15.1Alward, Susan, Ron Alward and Witold Rybczynski. *Rooftop Wastelands*. Montreal: McGill University, n.d.

A report on the feasibility of rooftop gardening in an urban setting, by a team of McGill researchers.

3.15.2Backhouse, Frances. "Grass-Roots Roofing: A Down-to Earth Alternative to Shingles and Shakes." *Harrowsmith*, 5.12 (1988): 68-77.

A discussion of the benefits—and drawbacks—of sod roofing, based on examples from Hornby Island, B.C., where "at least 18 houses, as well as the community hall and the local pub, have sod or planted roofs." One of the ecological benefits of sod roofs is that, left alone, they become havens for local, indigenous plant species.

3.15.3Baines, Chris. *The Wild Side of Town: How You Can Help and Enjoy the Wildlife around You*. London: BBC Publications and Elm Tree Books, 1986.

This engaging book deals with urban wildlife, both flora and fauna. In the U.K., Baines points out, wild spaces—undeveloped, untended patches of green—make up 20% of the most "urban" city—more wildscape than can be found on a typical modern farm. These little-noticed green spaces play a vital role in providing habitats for myriad species of wild plants and animals. They are also favourite recreational areas for both children and adults, who often prefer "neglected" areas to manicured parks and gardens. Baines explains how individuals, groups and communities can make urban landscapes—lawns, gardens, "vacant" lots, parks, urban wetlands and woodlands—into rich habitats for wild nature. Baines also points out that conservation activities can provide a much-needed source of jobs for unemployed Britons.

3.15.4Dawe, Gerald F.M. *An Introduction to Habitat Creation*. Birmingham, UK: Centre for Human Ecology, University of Birmingham, 1991.

The origins of habitat creation, use of native plant assemblages in landscape design, and their use in practice and within conventional ecological wisdom is described. Contents include habitat components and opportunities,

community involvement and environmental education, planting for insects, birds and plant diversity, case studies of successful habitat communities, monitoring, etc.

3.15.5Elmhirst, J.M. and N.P. Cain. *Review of Roadside Wildflower Programs and Feasibility in Ontario.* Toronto: Ontario Ministry of Transportation, Research and Development Branch, May 1990.

While this report is intended primarily for rural highways, it will also be useful to those concerned with developing low maintenance and natural landscape in urban areas. It contains detailed description of programs in the American states and Canadian provinces, including an evaluation of successes and failures, as well as a valuable bibliography and names and addresses of sources for the programs described.

3.15.6Emery, Malcolm. *Promoting Nature in Cities and Towns: A Practical Guide.* London/Sydney/Dover, NH: Croom Helm, 1986.

This book, drawing on extensive experience of urban nature conservation efforts in Britain, contains a rationale for urban wildlife conservation, and gives lengthy and detailed guidelines for forming and administering an urban wildlife group, and creating and managing urban ecology parks. Although the book specifically addresses British readers, much of the information is adaptable to North American settings. This is valuable, step-by-step guide to any group or agency interested in learning more about urban nature conservancy and naturalizing urban green space.

3.15.7Fox, Tom, Ian Koeppel and Susan Kellam. *Struggle for Space: The Greening of New York City 1970-1984.* New York: Neighborhood Open Space Coalition, 1985.

This book documents the rise of the grassroots movement to provide green space—community gardens (urban farming, parks, playgrounds)—in inner city neighbourhoods in New York City. The technical, financial and administrative components of such projects are discussed, and the psychological, social, educational, environmental and economic benefits of inner city greening are described. An extensive bibliography on urban gardening, organization, site design and urban land use and design is provided.

3.15.8Francis, Mark, Lis Cashdan and Lynn Paxson. *Community Open Spaces: Greening Neighborhoods Through Community Action and Land Conservation.* Washington, DC/Covelo, CA: Island Press, 1984.

A report on the community open space movement, both in Europe and the U.S. Projects in New York City are described and evaluated, and recommendations for the future of the projects are made.

3.15.9Laurie, Ian C. *Nature in Cities: The Natural Environment in the Design and Development of Urban Green Space.* Chichester/New York/Brisbane/Toronto: John Wiley & Sons, 1979.

A collection of papers by an interdisciplinary group of landscape architects and scientists on aspects of urban nature. Papers are arranged under five main headings: The philosophic context; The ecological context; Natural history in cities; Natural character in urban spaces; Landscape planning and management. Examples of natural/ecological landscaping in Britain, Germany, Holland, France and Scandinavia are provided.

3.15.10Mabey, Richard. *The Unofficial Countryside.* London: Collins, 1973.

A year-long "nature walk" through London

and its suburbs, revealing the character and extent of the "unofficial countryside"—the neglected spaces, nooks and niches, reclaimed by tenacious wild flora and fauna, which can be found in any urban centre. Ironically, it is in the abandoned, "undeveloped" areas of the city, not the parklands, in which wild nature flourishes in the city. Mabey advocates making the city a more hospitable environment for all forms of life.

3.15.11**Mudrak, L.Y.** "Sensory Mapping and Preferences for Urban Nature." *Landscape Research*, 7,2 (1982): 2-8.

This article surveys the literature on human preference for natural elements in the city (e.g., wildlife, vegetation, water). A technique called "sensory mapping"—a structured oral interview designed to elicit the sensory impressions of urban dwellers about the distinctive features of their city—is introduced. A case study of a sensory mapping project undertaken by the author in Ashland, Wisconsin is described. The study found that Ashland residents positively identified primitive/natural sensations, and experiences related to nearby Lake Superior, significantly more frequently than other urban-related perceptions. Urban planners and landscape architects should take note of urbanites' preference for natural elements in the urban landscape.

3.15.12**Savage, Jim.** "Rolling Back the Pavement." *Probe Post* (August 1986): 10-12.

A brief account of the genesis of Toronto's first ecology park, sponsored by the Pollution Probe Foundation, on what was formerly a vacant, paved lot in downtown Toronto, next to the site of Pollution Probe's Ecology House. Site planning was undertaken in 1984, and implementation began in 1985. Ecology Park includes reconstructed native woodland and (Ontario!) prairie, a demonstration of intensive vegetable growing techniques, "edible landscaping," a display of culinary, medicinal and industrial herbs, and "lawn alternatives."

3.15.13**Schiele, Lothar.** "Drei Methoden der Dachbegrünung." *Mein schöner Garten*, 2 (1988): 38-41.

A brief account of three methods of "green roof" cultivation: traditional sod roofs; intensive greening (roof gardens, complete with trees); and extensive greening (herbs, shrubs, mosses). The last alternative is the easiest to undertake, technically and financially. The environmental benefits of green roofing are briefly discussed.

3.15.14**Smyth, Bob.** "Britain's 'Green Revolution': Bringing Nature Back to the City." *Unesco Sources* (July/August 1990): 14.

This brief article introduces the trend in U.K. cities towards reclaiming and fostering wild spaces, nature reserves and ecology parks in urban areas. More than 60 U.K. cities boast local voluntary nature conservation organizations sponsored by the Nature Conservancy Council, in collaboration with Unesco's Man and the Biosphere Programme. Inner cities, characteristically "ecologically deficient," are a special focus for community "greening" initiatives.

3.15.15**Soule, Michael E.** "Land Use Planning and Wildlife Maintenance: Guidelines for Conserving Wildlife in the Urban Landscape." *Journal of the American Planning Association*, 57,3 (Summer 1991): 313-24.

Valuable for those interested in preventing species disappearance, this article provides guidelines for use by planners. Open space set-asides, as well as provision of corridors linking habitat patches, are amongst the most effective measures for encouraging species diversity and survival.

3.15.16**Spirn, Anne Whiston.** *The Granite*

Garden: Urban Nature and Human Design. New York: Basic Books, 1984.

Spirn, a landscape architect and environmental planner, wrote this book out of distrust of the "professional wisdom" that designing cities in concert with natural processes (an ecosystemic approach) was impractical or unrealistic. She discovered that a great deal of specialized, technical literature on urban nature is available, and this information is digested and presented learnedly and accessibly in this book.

The book is divided into six parts: City and Nature (introductory); Air (pollution and climate); Earth (landfilling and geological characteristics); water (pollution and flooding); Life (urban planting and wildlife); and The Urban Ecosystem. Each part outlines the massive and complex environmental problems engendered by the modern city with respect to the environmental issue specified, and provides information on how these problems can be (or, in some cases, have been) avoided, eliminated or mitigated. Parts 4-6 each end with "A Plan for Every City," which outlines the features of a comprehensive plan, and the characteristics of individual projects, designed to address the various sectors of the urban ecosystem at issue. The book ends with sketches of "the infernal city" and "the celestial city"—what cities *will be* if present trends continue, and what cities *could be* if cities were competently managed as ecosystems. "The barrier to building a better city," Spirn caustically observes, "is not lack of knowledge, but refusal to apply that knowledge" (p. 263). A lengthy, topically arranged bibliography is appended.

3.15.17Sukopp, H. and P. Werner. *Nature in Cities.* Nature and Environment Series No. 28. Strasbourg: Council of Europe, 1982.

A study of the role of cities in the ecosystem, with special emphasis on pollution and wildlife. The authors conclude that city development policies should provide for the protection of ecological zones and species.

3.15.18Usher, R. and J. Scarth. *Alberta's Wetlands: Water in the Bank.* Edmonton: Environment Council of Alberta, 1990.

Wetlands and their role in sustaining the environment and land productivity are defined and developed. A typology of wetlands is developed as well. The authors also document the removal of approximately 71% of Canadian prairie wetlands for agriculture, although they also indicate that only a small amount of wetlands have been converted to urban uses. A significant contribution of the report is contained in its comparative summary of the productive contribution of wetlands in relation to boreal forest and agriculture, its comprehensive summary of the economic benefits of wetlands and its outline of alternative methodologies for determining the value of wetlands.

3.15.19Wilson, Alexander. "Toward a Culture of Diversity: Politics in the Urban Ecosystem." *Border/Lines*, 4 (1985/86): 38-40.

A brief, but incisive, review of five books on urban nature and agriculture: *The Granite Garden*, by Anne Whiston Spirn; *City Form and Natural Process* by Michael Hough; *The Edible City Resource Manual* by Richard Britz *et al.*; *Community Open Spaces* by Mark Francis *et al.*; *Struggle for Space: The Greening of New York* by Tom Fox *et al.*; and *Community Gardening in Metro Toronto* by Eddie Chee *et al.* Wilson deplores the artificial, cultural dichotomy of "human" vs. "nature," and concludes that we must remake cities that are "biologically and culturally diverse, plural, heterogeneous, where at every point in the complex structure of life there are choices" (p. 40).

3.16Planning

3.16.1Burnham, Robert A. "The Divided Metropolis: Subdivision Control and the Demise of Comprehensive Metropolitan Planning in Hamilton County, Ohio, 1929-1953." *Planning Perspectives*, 6,1 (1991): 47-67.

A fervour for regional planning, culminating in the Regional Plan of New York and Environs (1929-1931), and reflecting a metropolitan mode of thought, took hold in the U.S.A. in the 1920s. City planners saw the city and its tributary region as the metropolis, the primary social and economic unit and object for planning. The metropolis transcended "arbitrary political lines" and sub-regional jurisdictions. How to provide for the orderly development of the entire region in face of the existence of these jurisdictions presented a dilemma. One response was the regional planning commission. This article describes the development of the co-operative method of regional planning involving all of the constituent municipalities and its growing effectiveness over the study period.

3.16.2Canadian Institute of Planners. *Reflections on Sustainable Planning*. Ottawa, 1991.

This discussion paper is based on a workshop held in Montreal, September 7-9, 1990, by the Canadian Institute of Planners. The document strongly supports adopting sustainable development or "sustainability" as a guiding principle and goal for Canadian planners. Sustainable development is seen as having a social/cultural aspect, as well as environmental and economic dimensions, and it has affinities with the Healthy Communities perspective. Human settlements, urbanization and the built environment have a vital role in sustainable development that has often been overlooked, and which planners should articulate. Planners, with their intimate knowledge of and key role in local issues are the logical candidates to implement sustainable development. A French translation of the Executive Summary is appended. Copies of the report are available from the Canadian Institute of Planners, 404-613 York Street, Ottawa, Ontario K1N 5T5.

3.16.3Chinitz, Benjamin. "Growth Management: Good for the Town, Bad for the Nation." *Journal of the American Planning Association*, 56,1 (1990): 3-8.

The author examines the fallacy of composition with respect to land policy, particular to growth management, in an effort to discover whether or not individual communities, as they implement land use regulations to protect the quality of their own environments in the face of growth, exacerbate or ameliorate the contemporary environmental concerns of the nation. He defines growth as demographic, as well as increases in economic prosperity. Until the advent of the energy crisis and the "nationalization" of clean air as a social goal, the critics of suburban sprawl were on the defensive. He concludes that growth management may not contribute to the solution, but neither does it contribute to the problem. Local efforts to conserve lands that are critical to the preservation of the environment are more likely to be complementary rather than competitive with similar efforts at the normal and global level. But growth management does increase house prices.

3.16.4Danielse, Luc. "Vers une planification écologistique pour les communautés durables." *Plan Canada*, 31,3 (1991): 33-38.

Danielse advocates "ecologistic planning"—planning which conceptualizes cities as ecosystems—as a means of implementing sustainable urban development. Essential urban life-supports (e.g., food, air, water, energy), basic urban services (e.g., infrastructure, transit), urban identities (e.g., natural and built heritage, culture) and urban interventions (e.g., citizen participation, urban government) should

be analyzed in terms of "what is, what will be, and what should be" in planning for sustainability.

3.16.5Doering, Ronald L. *et al.* *Planning for Sustainability: Towards Integrating Environmental Protection into Land Use Planning*. Toronto: Royal Commission on the Future of the Toronto Waterfront, June 1991.

As its work progressed, the Royal Commission concluded that the present system of land use planning and environmental management does not offer even minimal environmental protection, let alone the "ecosystem approach to restoring and regenerating the Greater Toronto Bioregion" advocated in its second interim report. This discussion paper reviews the ways in which the philosophy and principles of the ecosystem approach could best be integrated into the Ontario Planning Act and other relevant provincial legislation as it affects the Greater Toronto Bioregion.

3.16.6Ferguson, B.K. and R. Friday. "Ecological Performance Standards for Land Development." *Biological Conservation*, 26 (1983): 193-213.

A planning study in the Pittsburgh, Pennsylvania, region includes a methodology for measuring and classifying the impact of alternative developments on natural ecological systems and their performance. The allowable extent by which a development might reduce site ecological productivity is proposed. Alternative development plans for a sample site showed that developers can comply with the proposed standards by reducing the size of construction areas and locating construction in areas where pre-development productivity was lowest.

3.16.7Fowler, Edmund P. "Land Use in the Ecologically Sensible City." *Alternatives*, 18 (1991): 26-35.

The author documents the urgent need for land use decision makers to recognize the links between municipal land use, especially the deconcentrated city with segregated land use and large-scale developments, and deterioration of the environment. The objective of urban land use policy should include decentralized energy production and solid waste disposal.

3.16.8Friedman, John. "Planning, Politics and the Environment." *Journal of the American Planning Association*, 55,3 (1989): 334-38.

The author puts forward six propositions: (1) a good, that is, a life-supporting and life-enhancing, environment in metropolitan regions calls for a reduction in the long-term rate of capital accumulation and thus of regional economic growth; (2) a reduction in the rate of economic growth can be achieved in two ways: either by a equitable reduction of individual consumption expenditures (meaning higher taxes for urban infrastructure and an improved environment) or by shifting the bulk of environmental costs to those parts of the population least able to defend themselves; (3) the alternatives are intensely political; (4) a form of planning that seeks to improve the quality of the environment for the whole population will become increasingly politicized; (5) counterpart to a decentred planning for an improved environment is a strong central authority, powerful enough to carry out equitable policies of redistributions; and (6) the preceding propositions point to far-reaching implications for the education of planners.

3.16.9Gerecke, Kent and Barton Reid. "Planning, Power and Ethics." *Plan Canada*, 31,6 (1991): 59-74.

The authors distinguish between the various kinds of "corporatism" which have ruled city planning (New Right [*laissez-faire*], liberal, corporate responsibility, social democratic), and assert that the *laissez-faire* variety which now

dominates the profession is a threat to the integrity of planning and to the future of cities. The New Right agenda has led to the perversion of the concept of sustainable development into *sustained* development, in which cities are regarded as arenas for unlimited economic and physical growth, pitted against one another in global competition. An alternative agenda for future planning, integrating authentic principles of sustainability, is sketched, which includes ecology, empowerment, sustainable communities, urban uniqueness and proximity planning.

3.16.10**Gustafson, G.C.** ***et al.*** "The Oregon Land Use Act." *Journal of the American Planning Association*, 48,3 (Summer 1982).

The authors argue that the comprehensive state wide land use management program first initiated in 1973 represents an important new land use control and merits careful consideration, especially as it represents little substantial erosion of local flexibility. The combination of state-mandated, locally implemented urban growth boundary designations and exclusive farm use zoning represents a unique case in farm land protection policy, although its ultimate effectiveness depends on the commitment of local officials to minimum lot sizes and the retention of farm land in commercial agricultural production.

3.16.11**Hall, Peter.** *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century*. Oxford, UK: Basil Blackwell, 1988.

Gazing into the future in his conclusion, Hall laments the fact that urban planning may be torn by tension between its concern for an under class and increasing concern for the environment.

3.16.12**Harris, Chandler.** "Growth and Management Reconsidered." *Journal of Planning Literature*, 3,4 (1988): 462-88.

There are two separate streams of literature on the subject. The first is directed to municipalities, while the second recounts experiences with growth management.

3.16.13**Hathout, S. and J. Romanowski.** *Strategies for an Environmental Zonal Evaluation of the City of Winnipeg*. Urban Resources 3. Winnipeg: Institute of Urban Studies, 1992.

The complexity of assessing, monitoring and managing the environment within urban areas has been a growing concern for urban planners, particularly since they perceive that not all is as it should be with urban management. Environmental zoning is one rational first step in the management of the urban environment. The main purpose of this study is the assessment of the usefulness of diverse environmental factors in carrying out environmental zoning of urban areas. These urban environmental factors are: landscape (ground, space and pollution index) and urban ecosystem (tree density, built-up area and biomass index). The authors have found that these factors are compound as well as complementary in representing the urban environment. The authors have also found that the biomass index, derived from satellite imagery, can be used to carry out urban environmental zoning. (Abstract provided by authors).

3.16.14**Jennings, Michael D.** "The Weak Link in Land Use Planning." *Journal of the American Planning Association*, 55,2 (Spring 1989): 206-208.

Probably instructive for Canadians, a prominent natural scientist argues that the American planning discipline is quite far from coming to grips with the soil, water and biological resource degradation currently taking place on privately held land, as well as from

understanding the mechanisms by which the degradation is taking place. While optimism for greater institutional power resulting from a popularization of environmental issues may be warranted, real effectiveness of the revisionist version of American land use regulation is far from being realized. Progress in stabilizing the loss of natural resource capital is unlikely until ecological theory becomes fundamentally incorporated into land use planning decisions. An excellent bibliography on environmental degradation is appended.

3.16.15Karetz, Jack D. "Rational Arguments and Irrational Audiences: Psychology, Planning and Public Judgment." *Journal of the American Planning Association*, 55,4 (1989): 445-56.

Institutions involved in technological issues are increasingly confronting a phenomenon, which the author asserts is familiar to planners: hostile public audiences who read the facts differently from experts. Whether or not public judgement appears reasonable depends on which of several rival explanations of judgment bias one embraces. Garnering public acceptance often involves a professional dilemma of choosing between the morally questionable shaping of public preferences and the surrendering of complex choices to public biases. The author concludes that planners may be able to make a contribution to resolving such conflicts where scientists, technology managers and analysts are often fearful to tread. They can create contexts that foster liberation of biases and agreement on legitimate arrangements for dealing with uncertainty. Excellent references in the subject area are appended.

3.16.16Kozlowski, J.M. "Sustainable Development in Professional Planning: A Potential Contribution of the EIA and UET Concepts." *Landscape and Urban Planning*, 19,4 (December 1990): 307-32.

The author of this thoughtful article asserts that whether Environmental Impact Assessment (EIA) has reached the roots of environmental decay in the development of useful decision-making processes can be questioned. Location and scale of proposed projects are usually decided prior to EIA involvement by planners, precluding environmentally pro-active planning. The need for integration of ecological considerations into the planning process from the outset may be facilitated through the concept of "framing" development of spatial quantitative, qualitative and temporal environmental dimensions and dubbed Ultimate Environmental Threshold (UET).

3.16.17Levine, Myron A. and Jan Van Wiesep. "The Changing Nature of Dutch Urban Planning." *Journal of the American Planning Association*, 54,3 (1988): 315-24.

Dutch urban planning is known in part for its efforts to control and direct the suburbanization of Amsterdam. The authors assert that in recent years the Dutch planners have had to abandon their "concentrated deconcentration" approach in which they were losing the battle to prevent or minimize the loss of green and agricultural lands and focus their efforts on reurbanization of Amsterdam and other major cities. Multinational corporations, using their influence, were succeeding in making major incursions into the suburbs and greenbelts in locating their corporate headquarters, and one result was even greater pressures in the direction of suburbanization.

3.16.18Lowe, Marcia D. "Shaping Cities." *State of the World 1992*. In L.R. Brown *et al.*, eds. New York/London: W.W. Norton, 1992, pp. 119-37.

Advocates land-use planning integrated with transport planning to enhance urban sustainability.

3.16.19Man and the Biosphere Program. *Cities*

and Ecology: The International Experts Meeting on Ecological Approaches to Urban Planning Sponsored by UNESCO-MAB and UNEP in Cooperation with the USSR Commission for UNESCO and the USSR Commission for UNEP, September 24-30, 1984, Suzdal, USSR. 2 Vols. Moscow: Centre of International Projects of the USSR State Committee for Science and Technology, 1988.

These conference proceedings consist of technical papers on a variety of topics relevant to urban ecology and planning, by an interdisciplinary range of scholars, mostly European—many from Eastern Bloc countries. The papers are organized under four main headings: 1. The Conceptual and Methodological Basis for Integrated Urban Planning; 2. Applying an Integrated, Ecological Framework to the Concerns of Urban Planning; 3. Ecological Planning in Specific Nations and Cities; 4. Public Participation in Urban Planning and Management.

3.16.20Mathur, Brijesh. "Community Planning and Sustainable Development." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 19-37.

This paper reviews that literature on sustainable development which deals with the interpretation of sustainable development in terms of urbanization generally and cities in particular, to extract those dimensions which have a bearing upon applying the principles of sustainability to the planning of Canadian cities. Implications are drawn for the extant values of Canadian planning and planners. (Abstract provided by the author).

3.16.21Nawaz, Rasheeda. "Sustainable Urban Development for Ottawa: Planners Can Make a Difference!" *Plan Canada*, 31,6 (1991): 54-58.

An account of the process leading to the approval of the City of Ottawa's Official Plan (May 28, 1991), Canada's first "green" land use plan that integrates sustainable development principles throughout. The author, a member of the Official Plan Review Team, emphasizes the role of planners as catalysts and intermediaries between politicians and the community.

3.16.22Ottawa-Carleton Regional Planning Department. *Opportunities for Residential Intensification in Ottawa-Carleton.* Ottawa: Regional Municipality of Ottawa-Carleton, September 1990.

This report identifies rising land consumption in each quinquennial period since 1961, summarizes data on net densities in other jurisdictions, and analyses opportunities for intensification within Ottawa-Carleton, concluding that between 1990 and 2010, some 24,500 dwelling units can be provided one green field lands within the greenbelt and that about 16,500 of these can be built in areas already considered developed. It also describes a City of Ottawa program for replacing combined sanitary-storm sewers over a 35 year period, which will assist in making intensification possible.

3.16.23Porter, Douglas R. "Incipient Ideologies of Growth and Development." *Urban Land* (June 1991): 34-35.

Beginning with Logan and Molotch's *The Political Economy of Place* (1987), which asserts that city growth occurs because business forces cities to compete for capital, and proceeding to John Friedman's summer 1989 article on sustainable development in the *Journal of the American Planning Association*, the author advises land developers to pay greater attention to the growing green movement.

3.16.24Power, G. "The Advent of Zoning." *Planning Perspectives*, 4,1 (1989): 1-13.

This essay examines some members of the legal profession, including judges, who were instrumental in the enactment of and judicial approval of American zoning laws. They were members of the upper class with an interest in protecting their fine residential neighbourhoods from the location of cheap housing or business nearby, reformers looking to zoning to increase the influence of the business/professional community, planning advocates hoping that zoning would be a first step in the development of comprehensive planning to guide the physical growth of cities, and conservative ideologues who saw in zoning a scheme to classify the population and to segregate them according to their station in life. The first comprehensive zoning ordinance was adopted by New York City in 1916.

3.16.25Richardson, Nigel H. *et al.* *Economic Benefits of a Clean Environment: Sudbury Case Study*. Toronto: N.H. Richardson Consulting, October 1989.

Provided with data on environmental quality, primarily air quality, as well as employment data disaggregated by industry, the authors carried out a survey of Sudbury leaders and observers to determine any relationship between increases in service employment in the community and improvements in environmental quality. In concluding, they indicate that increases in employment in the hospitality industry can be associated with environmental improvements, but that the other service industry employment increases may have resulted without the environmental improvements recorded. They also conclude that the study approach may not be useful for addressing the original hypothesis.

3.16.26Richardson, Nigel. *Land Use Planning and Sustainable Development in Canada*. Ottawa: Minister of Supply and Services, 1989.

This paper argues strongly that land use planning is an essential component of sustainable development. It illustrates the present fragmented state of sustainable urban development, but also illustrates the potential with good examples. It advocates that land be considered part of the life support system, that land policy is as important as health or education policy and that thought be given to professional ethics in the light of the importance of land policy. Adoption of the goal of sustainable urban development is the first step in improved land use policies.

3.16.27Robinson, Ira and Brahm Wiesman. "Planning Without Theory: Reflections on Regional Planning Experience in Western Canada." In Thomas L. Harper, ed., *Planning in the West: Canadian and American Perspectives*. Calgary: Faculty of Environmental Studies, University of Calgary, 1988.

The authors commence their article by noting that Alberta and British Columbia are unique in the Western world for their establishment of a comprehensive system of regional planning agencies. In both provinces, regional planning agencies declined in the 1980s along with the slowing of population and economic growth. They suggest that the absence of a viable regional planning theory is at the root of the decline. An alternative hypothesis is that the fortunes of regional planning are related to cycles of growth and investment. With respect to the weakness of regional planning, the authors also note that most economic activity comes under the jurisdiction of other provincial agencies exempt from "control" by regional planning agencies. With respect to the future, the authors suggest that provincial governments will not be willing to give up sole authority over resource and economic development, and that municipalities are not willing to give up any authority in the land use area. They conclude that theory-building which might provide a supportive basis for regional planning lies in developing the paradigm of bioregionalism.

3.16.28Robinson, Ira M. and Douglas R. Webster. "Regional Planning in Canada." *Journal of the American Planning Association* (Winter 1985): 23-33.

Canada generally possesses two parallel, non-interacting systems of regional planning. Statutory regional land planning, which focuses on land use, occurs under provincial enabling legislation. Regional development planning, which focuses on socio-economic development, is undertaken both independently and jointly by the provincial and federal governments. The functions need to be integrated for successful regional planning in the future.

3.16.29Stach, Patricia Burgess. "Zoning: To Plan and To Protect." *Journal of Planning Literature*, 2,4 (1987): 472-81.

One of several articles on the subject of zoning that suggests that the function of zoning is heavily weighted towards "protecting" over "planning."

3.16.30United Kingdom, Department of the Environment. *Planning Control in Western Europe*. London: HMSO, 1989.

Carried out under contract by the Joint Centre for Land Development Studies at the University of Reading, this document contains detailed descriptions of the formal planning systems in Denmark, France, western Germany and the Netherlands.

3.16.31Vogel, Ronald K. and Bert E. Swanson. "The Growth Machine vs. the Anti-growth Coalition." *Urban Affairs Quarterly*, 25,1 (1989): 63-85.

Growth management is touted as a national planning process to arrive at community decisions regarding growth rates and the mix of residential, industrial and commercial development. Growth management may help to resolve conflict between growth and non-growth advocates. Using a case study of Gainsborough, Florida, the authors conclude that growth management has not ended the battles between growth machines and anti-growth coalitions. Neighbourhood advocates continue to be concerned with protecting the integrity of their neighbourhoods, and are unwilling to accept higher density levels as a trade-off for preserving green space somewhere else.

3.16.32Zehner, Robert. "Environmental Priorities and the Greenhouse." *Australian Planner* (March 1991): 33-38.

This brief article reports the results of a survey of local government authorities (LGAs) throughout Australia with respect to the extent to which exercise of their planning functions have been informed or determined by the "greenhouse effect." It is potentially of use to Canadian planners intending to undertake similar surveys in Canada. The author speculates in passing that Australian states should seriously consider issuing guidelines or directives regarding appropriate planning responses to the greenhouse effect, as many planners, especially those from the smaller LGAs do not have knowledge of potential impact of the greenhouse effect on the local environment and/or are not able to relate local government powers to such impacts.

3.17*Policy*

3.17.1Association of Municipal Clerks and Treasurers of Ontario and Intergovernmental Committee on Urban and Regional Research. *Management Symposium: Implementing Sustainable Development in Municipalities.* Collingwood, ON: The Centre for High Performance, 1991.

A summary report of a Management Symposium, primarily attended by municipal officials, which took place May 8-10, 1991.

The summary focuses on environmental, social and economic implications of sustainable development. Strategies for implementing sustainable development initiatives in municipalities are suggested. Highlights of the report are contributions by Colin Isaacs of Contemporary Information Analysis and Nigel Richardson of N.H. Richardson Consulting.

3.17.2Bregha, François, *et al.* *The Integration of Environmental Considerations into Government Policy*. Ottawa: Rawson Academy of Aquatic Science, September 1990.

Prepared for the Canadian Environmental Research Council, this report addresses the difficult institutional, procedural and methodological issues identified with integrating environmental considerations into government policy-making processes. Topics included are scope, responsibility, criteria, process, monitoring and accountability, public consultation and scientific, information and assessment methodologies. The two case studies in energy and agriculture undertaken as part of the project suggest that mutually reinforcing barriers with respect to lack of clear objectives, insufficient political will, narrow definition of issues, existing organizational structure, absence of accountability, bureaucratic politics, lack of information and absence of incentives constrain the integrated assessment of policy. Among other things, the report concludes with a recommendation that a position of Parliamentary Commissioner for the Environment to audit government's compliance with its own environmental assessment process be created.

3.17.3Button, Kenneth J. and David W. Pearce. "Improving the Urban Environment: How to Adjust National and Local Government Policy for Sustainable Urban Growth." *Progress in Planning* (1989): 137-84.

This paper, divided into five sections, covers the following topics: inner city decline and the link between environmental quality and urban economic performance; urban environmental problems and urban features which contribute to them; economic policy instruments for ameliorating urban environmental problems; six stages of urban development and policy tools appropriate for each state; and approaches to environmental policy evaluation.

3.17.4Cullingworth, J.B. "Groping for a National Urban Policy: The Case of Canada." *Planning Perspectives*, 1,2 (May 1986): 95-106.

In the late 1960s, several countries introduced administrative organizations or reorganizations for devising and implementing national urban policies. This article examines the creation and then dismemberment of the Ministry of State for Urban Affairs. It raises serious doubts about the viability of national urban policy and the capability of a central agency to affect them.

3.17.5Ehrlich, Bruce and Peter Dreier. "Downtown Development and Urban Reform: The Politics of Boston's Linkage Policy." *Urban Affairs Quarterly*, 26,3 (1991): 354-75.

Urban policy makers and analysts are increasingly discussing the limitations and potential for local governments to adopt progressive economic and social policies. Limiting forces include the geographical mobility of private capital, the federal system of government and the political power of local business and real estate interests. A case study of Boston is used to explore the limits of local progressive policy. The authors conclude that other certain growth and social conditions, growth can be facilitated by expanding participatory and redistributive public policies.

3.17.6Jahoda, Marie. "Postscript on Social Change." H.S.D. Cole *et al.*, eds. *Thinking About the Future: A Critique of "The Limits to Growth."* Sussex, UK: Sussex University

Press, 1973.

Convenor of the small group at Sussex University's Science Policy Research Unit that formulated the "critique", the author concludes that the ultimate failure of Forrester and Meadows and their model of world dynamics is their failure fully to acknowledge the significance of the assumptions underlying the model and of the capacity for humans to mould their own future through the political process, although she also concludes that the debate that has been generated will have been of value to the extent that it motivates societies to tackle problems that are indeed serious. She accepts that there are serious environmental problems that societies and communities must address, but nevertheless asserts that humankind has on numerous occasions demonstrated a capacity to respond to incipient and latent crises and that, though there are risks, societies may be able to do so again.

3.17.7Kaplan, Marshall. "Infrastructure Policy, Repetitive Studies, Uneven Response, Next Steps." *Urban Affairs Quarterly*, 25,3 (1990): 371-88.

The author begins by identifying a number of assessments of infrastructure needs over the preceding decade. Most authors have warned of the consequences of the failure of public and private sectors to act on the nation's infrastructure problems.

3.17.8National Round Table on the Environment and the Economy. ***Sustainable Development and the Municipality.*** Ottawa: NRTEE, 1991.

A booklet, published by the NRTEE, inviting municipalities to set up local Round Tables on the environment and the economy. The rationale for municipal action on sustainable development, guidelines for establishing a municipal round table, and suggested roles for such a body, are given. Available from: National Round Table on the Environment and the Economy, 1 Nicholas Street, Suite 520, Ottawa, Ontario K1N 7B7. Tel. (613) 992-7189, Fax (613) 992-7385.

3.17.9Organization for Economic Co-operation (OECD). *Environmental Policies for Cities in the 1990s.* Paris: OECD, 1990.

This report, whose 20 case studies drawn from the 24 OECD member nations provide a practical guide to implementing the Bruntdland Report in urban areas, makes a strong argument for focusing sustainable activities on urban areas. While the authors conclude that current economics do not make a proper accounting of environmental considerations, they nevertheless utilize conventional economic methods in discussing a policy agenda for the future.

3.17.10Paehlke, Robert and Douglas Torgerson, eds. *Managing Leviathan: Environmental Politics and the Administrative State.* Peterborough, ON: Broadview Press, 1990.

This collection of essays explores two essential themes central to the issue of managing environmental issues. On the one hand, overly centralized and impenetrable bureaucracies ease the way for bureaucrats and politicians alike to permit polluters to continue environmentally unsound practices. This state is due in part to the perception that economic growth needs to be pursued at any cost. As well, that the environmental agenda is largely scientifically driven makes environmental policy impenetrable by the public.

3.17.11*Urban Environmental Policy Options.* Working Paper Series 2. Toronto: Canadian Urban Institute, 1991.

This is a discussion paper prepared by the Canadian Urban Institute for the Federation of Canadian Municipalities' National Board of Directors meeting in September 1990. The

report begins with a "continuum of policy positions"—a "generic range of potential policy positions within which specific positions would likely fit" (p. 2). The remainder of the paper reviews urban environmental issues under the headings of waste management, sewer and water, and air. Each section includes specific policy recommendations. The paper concludes with a statement of guiding principles for municipal environmental policy, and recommendations concerning urban environmental policy statements and environmental audits.

3.18*Rural/Urban Relationships*

3.18.1Beesley, K. and L.H. Russwarm, eds. *The Rural-Urban Fringe: Canadian Perspectives*. Downsview: York University, Department of Geography, Research Monograph No. 10, 1981.

Presented at a special session of the Canadian Association of Geographers in 1980, the academic papers in this volume both represent the state of research by geographers at that time and are extremely contemporary as well. The dominant theme is the increasing domination of the rural-urban fringe by urbanization and the ambivalence towards rural areas by urban Canadians. The emerging trend is for a greater diffusion of urbanites into the country environment, reflecting the attractiveness of rural living and the economic benefits associated with living in urban areas.

3.18.2Bryant, C.R. "The Recent Evolution of Farming Landscapes in Urban-Centred Regions." *Landscape Planning*, 11: 307-26.

The author develops a taxonomy of forces relevant to the relationship between urban and rural areas and concludes that not all urbanization forces have a negative impact on agricultural productivity. The author also notes that the impact of urbanization varies through time with other forces operating in agricultural economics to determine productivity.

3.18.3Calgary Regional Planning Commission. *Country Residential Survey*. Calgary: Calgary Regional Planning Commission, 1978.

This volume contains the results of a survey of a 10% sample of country residents in 1976. Non-farm rural residents are characterized by a family size of four, previous residence in a single family residence in Calgary, employment in Calgary, transport to which is by private car in less than 30 minutes, children who travel at least five miles to school by bus, a tendency not to patronize local shops and suppliers and incomes at the higher end of the income scale. Country living is often associated with a desire for expanded living space, aesthetics and amenities. Unlike a similar survey carried out in 1976, residents did not seem to be motivated by a quest for cheaper living, and their living costs were above average. Hilly environments were preferred. It is projected that future demand for country living will be proportional to future population growth. The amount of additional land required (298 quarter sections) would be equal to an area twice the existing size of Calgary and would yield a population of only 16,000.

3.18.4Calgary Regional Planning Commission. *The Role of Land Use Planning in Maintaining and Expanding Alberta's Agricultural Land Base*. Calgary: The Calgary Regional Planning Commission, Submission to the Environment Council of Alberta, August 1983.

The brief exhorts the provincial government to assume a leadership role in maintaining and expanding the province's agricultural land base, urges it to issue a policy statement on the use of the province's agricultural land base, develop routine policies and programs for meeting agricultural land objectives, and support policy statements with legislation. A second part of the

brief describes the loss of agricultural land. In the Calgary region over 47,000 acres of land are in agricultural Classes I-III. 2.5% of the total in the Calgary region, was removed from agricultural production from 1971 to 1982.

3.18.5Calgary Regional Planning Commission. *Some Characteristics of Small Parcels in the Calgary Region*. Calgary: Calgary Regional Planning Commission, May 1986.

The Commission directed its staff to examine the current land use of parcels in the 20 acre range to determine their current use and whether further subdivision would erode still further agricultural production potential of the Region. There were 2500 parcels between 4 and 21 acres encompassing 36,000 acres. About 60% were located in the area identified as the Calgary Fringe. Only 225 parcels were still used predominately for agriculture, while 85% had residence as the main use. About 63% of the latter were land in agricultural classes I-III (prime). The preliminary conclusion is that while further subdivision might not harm agricultural potential any more than it has already been harmed by permitting subdivision in the first place, the nub of the problem is the location of so many of the parcels in urban growth corridors.

3.18.6Calgary Regional Planning Commission. *Fragmentation Study: Technical Appendix, Volume 2, Literature Review*. Calgary: Calgary Regional Planning Commission, January 12, 1987.

This review is organized under five headings: theoretical overview; cost/revenue studies; studies on policy alternatives; studies and reports from other urban municipalities; and surveys.

3.18.7Coppack, Philip M., Lorne H. Russwurm and Christopher R. Bryant, eds. *Essays on Canadian Urban Process and Form III: The Urban Field*. Waterloo: University of Waterloo, Department of Geography Publication Series No. 30, 1988.

This third volume in the series on impact of urban areas on rural focuses on the "urban field," the most recent evolutionary stage in the development of settlement structures. The driving forces are described in various articles as the pursuit of amenity environments and the impact of technology and communications on resident's perceived needs. The first seven chapters are theoretical in nature, while empirical studies in southwestern Ontario are pursued in the final three chapters.

3.18.8Dobson, Ross. "Sustainable City, Sustainable Country: *City Magazine* Interviews Pat Mooney." *City Magazine*, 10,3 (Winter 1988): 10-18.

Pat Mooney, who lives on a co-operative farm near Brandon, Manitoba, is co-director of The Rural Advancement Fund International, a consulting agency for Third World development based in Amsterdam. This interview points out that whereas European cities once lived within bioregional constraints, Canadian cities have always been, and continue as, artificial commercial "islands" over against the countryside. At the same time, Canadian agriculture is in decline as Europe and the Third World become less dependent on North American agribusiness for their food supply. Mooney advocates bioregionally sensitive agriculture, repopulation of the countryside by urbanites and an agriculture geared to local need and self-reliance as keys to sustainable cities and rural areas.

3.18.9Edmonton, City of, Planning and Development Department. "Paving Paradise: The Plight of Our Prime Farmland." *City Trends* (October 1989): 11-13.

This short article was motivated by a presentation made by the Christian Farmers

Association of Alberta to the City of Edmonton Council with respect to a new draft plan for the City. Between 1976 and 1980, over 36,000 ha of prime agricultural land was lost to urbanization in Canada. A study by Alberta Agriculture concluded that urbanization was the main cause of losses of Classes I and II agricultural land in that province. In the 15 years between 1966 and 1981, Edmonton was second only to Metropolitan Toronto in total land lost to urbanization. Edmonton adopted an Agricultural Land Management Program in 1986, partly to assure the "orderly" development of the farmland annexed to the city in 1981, but the Association is critical of that as well, as they would like to see good farmland preserved in perpetuity. The Program leaves protected agricultural land and market gardening to be taxed at agricultural rates. Almost all of the undeveloped 16,000 ha of undeveloped land in Edmonton consists of Class I and II soils. Alternative development areas outside the city, chiefly Sherwood Park and St. Albert, are also on good soils. The article concludes with the observation that the provincial government has shown little interest in managing prime farmland, and its rejection of Edmonton's annexation plans in the early 1980s shows that it is also unwilling to provide the city with that opportunity.

3.18.10Edmonton, City of, Regional Planning Commission. *Rural Land Use Policy.* Edmonton: Edmonton Regional Planning Commission, Position Paper No. 1, September 1975.

Commission objectives for agricultural land use are provided in summary and in detailed form. The objectives on agricultural land use included maintenance of agriculture as a valuable component of the regional economic base, improved agricultural efficiency, enhancement of the rural environment, improvement in the standard of living of the rural sector of the community, and opposition to unwarranted fragmentation of prime agricultural land for non-agricultural purposes. Methods for reaching these general aims are specified. The policy prohibited country residence use on prime agricultural land not already fragmented. The policy also permitted areas for small farms and established conditions for exceptional subdivision.

3.18.11Everitt, John, Robert Annis and Fred McGuinness. "The Responsibility of Urban Dwellers to Foster Sustainable Rural Communities." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 119-48.

The concept of "sustainability" is a relatively recent one, and has been associated particularly with the agricultural world. However, an important dimension has often been neglected or lost in many such discussions—namely, the small communities which are, by their nature, an integral part of this rural society. Overwhelming recent evidence demonstrates that even the strongest of rural communities have recently been faced with decline, and perhaps that sometimes this downscaling has at best been ignored by, and maybe even welcomed by, urban society. This discussion presents the situation of the small settlements of Manitoba as examples within the Prairie context. It details the contemporary situation of smaller settlements in the rural areas of the province, it looks at the concept of sustainability in this framework, and it makes suggestions as to what could, and indeed must, be done in order to develop the present small communities in a sustainable way. (Abstract provided by the authors).

3.18.12Gustafson, G.C. *et al.* "The Oregon Land Use Act." *Journal of the American Planning Association*, 48,3 (Summer 1982): 365-74.

The authors argue that the comprehensive

state wide land use management program first initiated in 1973 represents an important new land use control and merits careful consideration, especially as it represents little substantial erosion of local flexibility. The combination of state-mandated, locally implemented urban growth boundary designations and exclusive farm use zoning represents a unique case in farm land protection policy, although its ultimate effectiveness depends on the commitment of local officials to minimum lot sizes and the retention of farm land in commercial agricultural production.

3.18.13Keall, M.J., ed. *Development at the Edge: A Symposium Investigating the Integration of Conservation Strategies and Planning Development on the Edge of Cities.* Downsview, ON: York University Urban Studies Program, February 1986

The symposium brought together a variety of participants from the real estate development industry, conservationists and academics to discuss planning and conservation problems on the edge of cities, primarily the Greater Toronto Area, and their solutions. The participants reportedly agreed that there must be an integration of concern for the environment and strategies for economic development in such a way that economic and development policies must be subjected to their environmental implications.

3.18.14Joseph, A.E., B. Smit and G.P. McIlravey. "Consumer Preferences for Rural Residences: A Conjoint Analysis of Ontario." *Environment and Planning*, 21 (1988): 47-63.

Based on a study of 22 home buyers, the authors conclude that the dominant motivation for country residence is the seeking of privacy, as the expressed preference of subjects is for medium-sized or large lots in isolated locations. One implication of this is the potential for use of controls to increase the attractiveness of high density village locations.

3.18.15Lant, C.L. and R.S. Roberts. "Greenbelts in the Corn Belt: Riparian Wetlands, Intrinsic Values and Market Failure." *Environment and Planning*, 22 (1990): 1375-88.

Historical agricultural practices have severely undermined the recreational quality and ecological integrity of streams and other bodies of water in the Midwest of the U.S.A. Re-establishment of riparian forest corridors would create wetland buffers partially protecting water quality and aquatic ecosystems. Empirical analysis suggests that willingness to pay for river quality is related to income and recreational participation, but not to other spatial socio-economic variables, leading the author to conclude that market failure has occurred. As a result, the U.S. government has implemented a Conservation Reserve Program to pay farmers to retire highly erodible cropland. The target is a 12% reduction in U.S. croplands.

3.18.16Manning, Edward W. *Towards Sustainable Land Use: A Strategy.* Ottawa: Lands Directorate, Environment Canada, April 1986.

A synthesis of concerns with respect to the use of land in Canada, issues are presented and an evaluation is proposed with respect to current research and response to these issues. While Canada is advanced in the inventory of land and its potential, the paper documents many major gaps in the mechanisms to ensure that this information is adequately utilized for land use and management.

3.18.17Metropolitan Planning Department. *Methods of Preserving Agricultural Land in the GTA.* Toronto: Municipality of Metropolitan Toronto, Metropolitan Planning Department, April 1991.

Undertaken as part of its own review of its

structure plan for Metropolitan Toronto, this report concludes that none of the three alternative scenarios envisaged in the *Greater Toronto Area Urban Structure Concepts Study* is suitable for the future. On the critical point of a sustainable transportation system the conditions needed to support a comprehensive public transportation system cannot be reached above the region even if twenty years of population growth were confined to the existing urbanized area surrounding Metro Toronto.

3.18.18Nelson, Arthur C. "An Empirical Note on How Regional Urban Containment Policy Influences an Interaction Between Greenbelt and Exurban Land Markets." *Journal of the American Planning Association*, 54,2 (1988): 315-24.

This article summarizes the theory of how regional urban containment policy should influence the regional land market, providing special reference to the interaction between greenbelt and exurban land markets separated by containment policies. The model is applied to a case study, demonstrating that the demand for exurban land shifts into exurban districts and away from farm land protected in greenbelts.

3.18.19Reid, Evelyne Power and Maurice Yeates. "Bill 90—An Act to Protect Agricultural Land: An Assessment of Its Success in Laprairie County, Quebec." *Urban Geography*, 12,4 (July/August 1991): 295-309.

In 1978, a commission was given power to designate urban and rural zones, preserve agricultural lands and promote the transfer of vacant land back to agricultural use. Using case studies and aerial photographs, the authors note that conversion was slowed and urban expansion tended to be confined to areas contiguous to existing development in the initial years of the commission's existence. They believe that political will is a significant ingredient to such policies and that there is evidence of much lower success rates following the change of government in 1985.

3.18.20Russwurm, Lorne H. "Land in the Urban Fringe: Conflicts and their Policy Implications." In *Essays on Canadian Urban Process and Form II*. Waterloo, ON: University of Waterloo, Department of Geography Publication Series, 1980.

As in his previous publications, the author stresses the importance of a single planning agency having responsibility for the built-up area, as well as the area comprising the urban fringe. He asserts that the primary issue facing planners and local and provincial governments is not whether there will be an urban fringe, one in which there are also likely an urban population, but with rural residences, but whether the land space resource will be used in an increasingly rational, more optimal way to the benefit of both individuals and society. He recommends that if country residential lots are to be permitted in the urban fringe, then such development must be seen as part of a system of closely interrelated parts, all of which require simultaneous planning. The common approach of establishing large minimum lots does not constitute the systematic approach that he suggests. Designated areas for small cluster developments, based mostly on small, but variable, lot sizes is required. He indicates that the Winnipeg region studies of the Manitoba government and the Alberta provincial planning branch outline such an approach.

3.18.21Russwurm, Lorne H. *The Surroundings of Our Cities: Problems and Implications of Urban Fringe Landscapes*. Ottawa: Community Planning Press, 1977.

Considered an introductory reader for undergraduate students, this volume develops a morphology of land management problems in the inner and outer fringe of typical urban areas and in the area of the "urban shadow," and discusses

governmental structures and land use planning mechanisms designed to address regional planning needs. He identifies conflict between economic criteria, where the highest bidder determines land use, and notions of aesthetic and ecological value, as principal issues in the urban fringe. Fragmentation of land holdings and the difficulty of returning passively used land to agricultural production are identified as particular problems.

3.18.22**Thompson, Peggy S.** *Rural Subdivision in the Edmonton, Battle River, Red Deer, and Calgary Regional Planning Commissions, 1977-1979*. Edmonton: Environment Council of Alberta, February 1982.

Over 150,000 acres, of which almost 79,000 acres were for non-agricultural uses, were approved for subdivision in the study period (50,000 acres/year). Comparison with a similar study carried out for 1969-1973 indicated a tightening of control between the two study periods. The impact of country residence living on prime agricultural land may have been much larger, as the author concluded that many of the "farmsteads" approved were in effect country residences. About half of the land affected was agricultural classes I -III, and the effect on rural agriculture could be substantial. Over 22% of such soils are in the Edmonton-Calgary corridor. In conclusion, the author notes the tension between the desire for country residence and the desire to conserve agricultural land.

3.18.23**Yeates, M.** *Land in Canada's Urban Heartland*. Ottawa: Environment Canada, 1985.

The author acknowledges the major loss in productive agricultural land occasioned by urban development, but also notes that it is difficult to argue successfully for rural land preservation on the grounds of food production in a time of declining prices for agricultural commodities. The high price commanded by land for urban development wins every time.

3.19*Third World*

3.19.1**Bell, Judith Kjellberg.** "Women, Environment and Urbanization in a Third World Context: A Guide to the Literature." *Women and Environments* (Spring 1992): 12-17.

A review of the literature (in English) on the way in which women in urban areas relate to their environment, including women's requirements for land and housing, household and family structure, responses to urbanization, means of earning income, access to services, use of resources and environmental activism. Based on a fuller article in *Environment and Urbanization*, 3,2 (October 1991) (see **Periodicals** section, below).

3.19.2**Furedy, Christine.** *Social Aspects of Solid Waste Recovery in Asian Cities*. Urban Studies Working Paper No. 15, York University, May 1990.

While waste collection is a major problem in many large Asian cities, in most, there exists an informal waste gathering and recycling industry that is often discouraged by municipal governments. Waste pickers who salvage wastes to meet their own needs and to sell to recyclers perform an essential role in Asia, but in many countries, they are accorded low social status. Municipal governments should recognize and harness the informal waste recovery resources that exist in their cities.

3.19.3**Hardoy, Jorge E. and David Satterthwaite.** *Environmental Problems in Third World Cities: Global Issue Ignored?* London: International Institute for Environment and Development, 1989.

In addition to outlining the scale and scope of environmental problems of Third World cities,

the authors discuss the linkage between city-based and rural problems and how the two must be considered together. It also addresses the role of privatization and how to mobilize action by citizens and their governments on global concerns such as climate change.

3.19.4Stren, Richard E. and Rodney R. White. *African Cities in Crisis: Managing Rapid Urban Growth*. Boulder, CO: Westview Press, 1989.

Based on original fieldwork by the authors and others, this book provides an assessment of the problems of language, colonial and planning traditions, climate and resources in managing rapid urban growth in African cities.

3.19.5United Nations Centre for Human Settlements (Habitat). *Urbanization and Sustainable Development in the Third World: An Unrecognized Global Issue*. Nairobi: UNCHS, 1989.

This report focuses on environmental problems that affect human health and quality of life, primarily in the mega-cities of the Third World: unhealthy housing; substandard or nonexistent infrastructure; toxic wastes and air and water pollution; deterioration of city-regions due to urban consumption and wastes; global climatic change. The role of governments in addressing these problems is stressed.

3.20*Transportation*

3.20.1Black, Alan. "Analysis of Trends in Transit Work Trips." *Journal of the American Planning Association*, 55,1 (1991): 38-44.

The author's regression analysis of transit work trip trends from 1970 to 1980 in the United States concluded that explanatory variables for changes fell into four groups: socio-economic characteristics of the population; structure of the region; recent growth and supply of transit services. Transit-oriented cities were dense and highly centralized. Central business district employment and population density had strong positive associations with transit use. There was little evidence to give planners hope for consistent nation-wide increases in transit use by boosting transit service.

3.20.2Boehmer-Christiansen, Sonja A. "Putting on the Brakes: Controlling Auto Emissions in Europe." *Environment*, 32,6 (July/August 1990): 17-20.

This short article summarizes the approaches to reducing auto emissions in Europe, focusing primarily on efforts to motivate consumers to alter transport modes, but also on research on alternative fuels. Reliance on fuel taxes, revenues from which vary upwards to over four times direct road expenditures in The Netherlands, are described as the currently most popular strategy. The author asserts that the primary beneficiaries of shifting to alternative fuels will likely be nuclear energy producers.

3.20.3Canadian Urban Transit Association. *The Environmental Benefits of Urban Transit*. Toronto: CUTA, April 1990.

This report cites the environmental disadvantages of private vehicles in support of the view that the role of public transit in Canadian cities should be enhanced. Supportive policies and actions from all levels of government are called for, in the areas of financial subsidies, tax incentives, supportive land use policies, traffic management policies and other measures.

3.20.4Cervero, Robert. "Unblocking Suburban Gridlock." *Journal of the American Planning Association*, 52,4 (1986): 389-406.

The author begins by observing that a suburban building boom in the U.S.A. during the previous decade sometimes produced traffic

jams equal to those found in congested downtowns. If trends continue, he fears that suburban gridlock could become the dominant transportation issue of the coming decade. He concludes that the U.S.A.'s best hope lies with redesigning work places into high-density, mixed-use clusters, strategically siting and phasing jobs and housing, introducing traffic impact fees (imposts) and trip reduction programs, as well as employer-initiated flex-time work schedules.

3.20.5Copenhagen. Lord Mayor's Department. Planning Directorate. *Traffic and Environment in Copenhagen*. UCEC - Conference in Amsterdam, October 24-28, 1990.

A summary of transportation planning issues, and anticipated planning measures, relevant to the Municipality of Copenhagen and the Copenhagen Metropolitan Region. Environmental and human health problems associated with the then-current traffic situation are identified. Transportation planning in Copenhagen must function within the framework of the Danish Government's *Transport Action Plan for Environment and Development*. Its goals are: stabilization of energy consumption and CO_2 emissions before 2005, and a 25% reduction by 2030; substantial NO_2 and HC emissions reductions by 2030; a 50% reduction in particle emissions in towns by 2010, and further reductions by 2030; a reduction in the number of homes with unacceptable outdoor noise levels by 2010.

3.20.6Giuliano, G. "Research Policy and Review 27: New Directions for Understanding Transportation and Land Use." *Environment and Planning*, 21 (1989): 145-58.

Recent studies provide additional evidence that residential location is not adequately explained as a function of job location. Toronto data show that occupation is a major variable in choosing residential location. With respect to the influence of new transportation facilities, studies in Atlanta, San Francisco and Washington, D.C. show that new rail transit facilities have had little influence on property values near new routes.

3.20.7Gordon, Peter *et al.* "Congestion, Changing Metropolitan Structure and City Size in the United States." *International Regional Science Review*, 12,1 (1989): 45-56.

Changing structure of cities is reason for increased sprawl and congestion.

3.20.8Gordon, Peter and Harry W. Richardson. "Gasoline Consumption and Cities: A Reply." *Journal of the American Planning Association*, 55,3 (1989): 342-46.

The main objective of this short article is to refute the conclusions of Newman and Kenworthy (see below) regarding variation in gasoline consumption. Citing Guiliano (1986) on Toronto: "evidence provided by impact studies indicates that rail systems have had little influence on urban structure. The most significant impacts have occurred in Toronto, Canada, where stringent land use controls have been employed to direct land use changes."

3.20.9Greenpeace. *The Environmental Impact of the Car*. Amsterdam: Greenpeace International, June 1991.

A thorough and readable report on the many environmental impacts of automobiles, including: global warming; air pollution and health consequences; oil extraction, transport and use (which involve water and land pollution, as well as wars to protect oil supplies); natural resources expended on car manufacture; environmental degradation caused by road building; safety problems; and impacts on urban form. The role of the car lobby in promoting and defending automobile use is described. In the face of the environmental degradation

caused, directly or indirectly, by the automobile industry—especially global warming—the report calls for a radical reformulation of transportation policy worldwide.

3.20.10Greenpeace. *Transit in Canada: A Handbook for Environmentalists*. Greenpeace Canada, April 1991.

This report, initially intended for internal use, has subsequently been released to the public. The report introduces basic elements of public transit systems and transportation planning, and discusses the relation between transportation planning and urban form. The report concludes with case studies of the transit systems of five Canadian cities: Toronto, Ottawa-Carleton, Vancouver, Regina and Saskatoon. Fifteen recommendations for transportation reform in Canada are made (p. 11). The report is poorly laid out (the copy which I received had pages missing, and many of the pages were out of order), but contains much useful information, and offers sound recommendations for transportation planning.

3.20.11Hall, Peter and Carmen Hass-Klau. "Can Rail Save the City?" *Plan Canada*, 26,4 (1986): 99-103.

Resulting from a comparative study of changes in German and British transport systems, the authors conclude that even if new rail transport attracts additional passengers, there is no guarantee that this will result in greater commercial activity in the downtown area. Intervening variables that might make a difference included the level of general prosperity in the community. Transport systems cannot turn a lack-lustre city core into an economically vibrant one. On the other hand, pedestrianisation of the city centre did seem to be a cause of greater pedestrian use of downtowns and an accompanying increase in commercial activity.

3.20.12Hanson, S., ed. *The Geography of Urban Transportation*. New York: Guilford Press, 1986.

This volume, assembled under the auspices of the Association of American Geographers, is still considered one of the better introductory text books. A major focus is discussion of energy issues, air, noise and social impacts of transportation and equity. It is suggested that the greatest energy savings may still result from increasing vehicle gas mileage still further and that increased efforts should also be devoted to increasing road capacity.

3.20.13Hope, D. and D. Yachuk. *Community Cycling Manual: A Planning and Design Guide*. Ottawa: Canadian Institute of Planners, 1990.

This manual aims to establish the bicyle as a valid means of transport in Canada; to encourage cycling; and to provide a safe environment for cycling. The manual covers planning concepts that underlie the advocacy of cycling as a transportation option, strategic planning, facilities design (bicycle routes, lanes and paths), street maintenance, driver, cyclist and pedestrian education, and enforcement of traffic rules.

3.20.14International Energy Agency Secretariat. *Fuel Efficiency of Passenger Cars*. Paris: Organisation for Economic Cooperation and Development, 1984.

Initiated in 1980 following the second large increase in oil prices, this volume documents progress and future targets for increases in energy efficiency and reductions in pollutants and greenhouse gases in the OECD countries, both individually and in total. Since the lifespan of the vehicle fleet is relatively short (10 years on average), making it possible to implement technological advances in a relatively short time, and since technological breakthroughs for oil substitution were still some time away, the study

focuses on efforts to increase efficiency.

3.20.15Kain, John F. "Deception in Dallas: Strategic Misrepresentation in Rail Transit Promotion and Evaluation." *Journal of the American Planning Association*, 56,2 (Spring 1990): 184-96.

Stimulated by concern that such practices are not extraordinary, this article describes the misuse of land use and ridership forecasts in Dallas in an unsuccessful effort to enlist voter approval for a 91-mile rail transit system. The transit authority tried to conceal information that the rail system would carry only slightly more riders than an unimproved bus system.

3.20.16Kim, Jon and Douglas S. West. "The Edmonton LRT: An Appropriate Choice." *Canadian Public Policy*, 17,2 (June 1991): 173-82.

This article is applicable in the instance of medium-sized and lower-density North American cities or portions thereof. Three factors led to the choice of the LRT option over express bus lanes in Edmonton: (1) provincial use of specific, non-matching grants; (2) 1981 population growth projections; and (3) lack of formal cost-benefit analysis. The authors assert that choice of an express bus option would have achieved the same objectives at lower cost. They cite low population densities (one-half of Toronto and one-third of Montreal) as a key factor in the optimum choice. Data on declining share of all work trips—decrease from 24% in 1981 to 17% in 1989—are also included.

3.20.17Lincoln Institute of Land Policy. *Linking Transportation and Land Use Planning: A Key to Suburban Growth Management*. Cambridge, MA: Lincoln Institute of Land Policy, 1992.

Including sections on the contribution of integrated transportation and land use planning to reducing car use and traffic congestion in Metropolitan Toronto, as well as other examples from Florida, Oregon and Texas, this collection of papers by experts stresses the need better to integrate transportation and land use planning.

3.20.18Lowe, Marcia D. "Cycling into the Future." In *State of the World, 1990*, L.R. Brown *et al.*, eds. New York: W.W. Norton, 1990, pp. 119-34.

A description of the current state of cycling in cities and countries worldwide. The report concludes with planning and policy recommendations to enhance cycling as a transportation option.

3.20.19McClintock, Hugh. "On the Right Track? An Assessment of Recent English Experience of Innovations in Urban Bicycle Planning." *Town Planning Review*, 58,3 (1987): 267-91.

A survey of urban bicycle planning initiatives in the U.K. since World War II.

3.20.20Meyer, J.R. and J.A. Gomez-Ibanez. *Autos, Transit and Cities: A Twentieth Century Fund Report*. Cambridge, MA: Harvard University Press, 1981.

The authors begin this comprehensive study with a review of the history of urban automobile use and travel in the U.S. and connect this development to suburbanization, which the authors see both as inevitable and as the product of increasing population, rising real incomes and falling real transportation costs. Their conclusion regarding reductions in the use of energy and auto dependence is that solutions lie in modification of the use and design of the automobile.

3.20.21Newman, Peter W.G. and J.R. Kenworthy. *Cities and Automobile Dependence*. Brookfield, VT: Gower Technical, 1989.

Resulting from personal data gathering in 32 cities (one in Canada), this monograph is essential reading for anyone interested in shifting modal split away from the private automobile. Using empirical data from each of the cities, the authors develop the thesis that gasoline use, public transit use and population and job density, as well as patterns, are intricately related to one another. The date are used in developing the conclusion that a residential density of 30-40 persons/ha is a critical threshold for lessening auto dependence and that reurbanization is critical to reaching such densities overall and new suburban development in particular.

3.20.22Newman, Peter W.G. and Jeffrey R. Kenworthy. "Gasoline Consumption and Cities: A Comparison of U.S. Cities with a Global Survey." *Journal of the American Planning Association*, 55,1 (1989): 24-37.

The authors found that gasoline consumption in ten large U.S. cities varied by up to 40%, primarily because of land use and transportation planning factors, rather than price or income variations. The same patterns, though more extreme, appeared in a global sample of 32 cities. Average gasoline consumption in U.S. cities was nearly twice as high as in Australian cities and Toronto, four times higher than in European cities and ten times higher than in Asian cities. Allowing for variation in gasoline prices, income and vehicle efficiency explain only half of these differences. The authors suggest that physical planning policies, particularly reurbanization and a reorientation of transit priorities as a means of reducing gasoline consumption and automobile dependence. Population and job density are key land use parameters. Urban structure within a city is fundamental to its gasoline consumption.

3.20.23Nijkamp, P. and S. Reichman, eds. *Transportation Planning in a Changing World.* Brookfield, VT: Gower, 1987.

Comprising the proceedings of three workshops sponsored by the European Science Foundation, this volume may represent the state of the art of European urban transportation planning. As their North American counterparts would probably have it, a major focus is on consumer behaviour and models of individual mobility.

3.20.24Nowlan, David M. and Greg Stewart. *The Effect of Downtown Population Growth on Commuting Trips: Some Recent Toronto Experience*. Papers on Planning and Design No. 35. Toronto: Program in Planning, University of Toronto, January 1990.

The authors are concerned with measuring the extent to which housing and population growth in downtown Toronto have affected the amount of work-related commuting into the central commercial area. In the last decade the trend towards reduced population in the central area has changed. Available data support the view that the unexpectedly lower inbound trips is the result of recent central area population growth and housing increase. This finding raises the possibility that further housing development and population intensification may be the key to overcoming a certain impasse.

3.20.25Ontario, Ministry of Transportation. *Sustainable Development and Transportation: A Primer*. Downsview: Ministry of Transportation, February 1991.

This report is subtitled "Background Information and Considerations for Transportation Practitioners," and contains the disclaimer that "This document does not purport to represent Ministry of Transportation policy or direction" (p. 1). The paper contains lengthy sections on the definition and background of sustainable development, with special emphasis on the six Ontario Round Table principles for sustainable development, which, it is suggested, should be integrated into transportation planning

and policy. The paper also briefly surveys how sustainable development and transportation might be linked, with respect to the atmosphere, water management and land use management. The emphasis is economic rather than environmental; the authors seem loath to consider changes to the transportation system that might impede economic growth, or upset the *status quo*. Other literature on the implications of sustainable development for transportation policy is not cited.

3.20.26Organisation for Economic Co-operation and Development. *Transport and the Environment*. Paris: OECD, 1988.

None of the technical solutions to urban transportation problems described in *Cities and Transport* begins to address the pollution problems stemming from urban transport. What has preoccupied urban transport planners is the lack of space for cars, not pollution. Yet, the OECD countries contain about 17% of the world's population. They contain about 80% of all motor vehicles, although the proportion is declining. Environmental air pollution across the globe from automobile usage can only worsen as motor vehicle use increases in non-member countries. From 1975 to 1985, OECD car population increased by 33%. The world's increased by 45%, implying that numbers of vehicles in non-member countries increased by 93% in the ten years. The U.K. government projects that the number of cars in that country will double in the near future.

3.20.27Pill, Juri. "Issues in Transit Policy." In John Hitchcock and Anne McMaster, eds., *The Metropolis: Proceedings of a Conference in Honour of Hans Blumenfeld*. Toronto: University of Toronto, Department of Geography and Centre for Urban and Community Studies, 1985.

Citing recent contributions to the urban transportation literature, the author concludes that the best use of new subsidy funds for urban public transportation is investment to create increased service quality. Using such funds to reduce fares may result in decreased service quality and in decreased ridership. He asserts that when transit is seen by the community as a charity service for those who cannot afford anything better, it inevitably acquires a stigma, and low fares become a self-fulfilling prophecy, as fare increases become impossible to implement for political reasons. He acknowledges that the relationships are non-linear and depend on elasticities of ridership in the face of changes in independent variables. He notes that the long-term decline in ridership on the Toronto Transit Corporation (TTC) between 1950 and 1965 was reversed only with the opening of new subway rail lines in the latter year.

3.20.28Pucher, John. "Urban Travel Behaviour as the Outcome of Public Policy: The Example of Modal Split in Western Europe and North America." *Journal of the American Planning Association*, 54,4 (1988): 509-20.

The author examines modal split in urban transportation systems for 12 countries in Western Europe and North America. He concludes that differences in travel behaviour arise largely from public policy differences, especially from differences in automobile (including use) taxation. Variations in transit subsidies, land use controls, and housing programs significantly influence travel choices, although sometimes only indirectly. The success of public transportation depends more on supportive urban development and automobile taxation policies than on transit subsidies.

3.20.29Smith, Graham Paul. "Calming the Traffic and Sharing the Street." *Plan Canada*, 26,4 (June 1986): 108-10.

The Dutch pioneered the shared surface approach to street design in which separate

pedestrian and vehicular areas, termed *Woonerf* after the innovator, are maintained. More than one in ten streets in Utrecht have been converted. This article reports on resident satisfaction with the new design. It concludes that residents are generally satisfied, but that they are critical of some details. While objective data indicate that traffic on the redesigned streets is slower, two-thirds of those surveyed indicated that traffic was as fast or faster than before. Planting affected observations considerably.

3.20.30Tolley, Rodney, ed. *The Greening of Urban Transport: Planning for Walking and Cycling in Western Cities*. London: Bellhaven Press, 1990.

The author introduces the idea of "traffic calming" as a way of slowing cars, reducing accidents, reducing the environmental degradation associated with traffic and generally improving the living conditions of residents. In addition to an introduction to the practice, most advanced and popular on the European continent, the volume contains a glossary of terms. Over 200 illustrations. Examples and cases are taken from the Netherlands and western Germany and include the ideas underlying various schemes, encouragement of cycling and walking and the practice of area-wide traffic restraint.

3.20.31Renner, Michael. "Transportation Tomorrow: Rethinking the Role of the Automobile." *The Futurist*, 23,2 (1989): 14-20.

The unique contribution of this article is in its ecological approach to the provision of transportation and emphasis on diversity of transportation modes as the best solution to urban transportation needs. The author insists that public transit will receive substantial additional patronage only after it becomes "multidestinational" (based on a grid) and serves other than centre city destinations.

3.20.32Viton, Philip A. "Economic Contributions to Transportation Planning." *Journal of Planning Literature*, I: 4,2 (1989): 139-53; II: 4,3 (1989): 270-85; III: 4,4 (1989): 445-59.

It is clear from this three-part article that the author has concluded that transit has an important role to play in local transport as a means of correcting situations in which the market will not allocate sufficient resources. The issue is identified as a critical one for the near future.

3.20.33Wachs, Martin. "Technique vs. Advocacy in Forecasting: A Study of Rail Rapid Transit." *Urban Resources*, 4,1 (Fall 1986): 23-30.

Following a review of numerous reports on rail transit demand projections, as well as on projected costs, the author concludes that demand forecasts routinely overestimate patronage and underestimate costs. The author asserts that the assumptions with respect to key parameters of demand are often chosen to justify projects favoured on the basis of local politics. The paper shows how consultants manipulate and massage their assumptions.

3.20.34Willson, Richard W. and Donald C. Shoup. "Parking Subsidies and Travel Choices: Assessing the Evidence." *Transportation*, 17 (1990): 141-57.

A review of empirical studies of how employer-paid parking affects employees' travel choices concludes that subsidies greatly increase solo driving. When these subsidies are reduced or removed, the studies show on the whole that solo drivers shift to carpools and/or transit.

3.21 *Waste Management*

3.21.1Canada, National Round Table on the

Environment and the Economy. *The National Waste Reduction Handbook*. Ottawa: National Roundtable on the Economy, 1991.

Designed for municipal decision-makers and informed by the Canadian Council of Environment Ministers' objective of reducing municipal solid waste by 50% by the year 2000, this report contains an introduction to source reduction and recycling. It contains major sections on waste reduction and then on recycling and composting.

3.21.2Conn, W. David. "Managing Household Hazardous Waste." *Journal of the American Planning Association*, 55,2 (1989): 192-203.

Planning may be called upon to assist local municipalities, which are under increasing pressure to implement community hazardous waste programs. However, there has been very little systematic examination of the actual risks or of the full costs, benefits and liabilities associated with collection.

3.21.3Costner, Pat and Joe Thornton. *Playing with Fire: Hazardous Waste Incineration*. Washington, DC: Greenpeace U.S.A., 1990.

This report discusses the inefficiencies of hazardous waste incineration, the preferred method of hazardous waste disposal in the U.S. Many toxic, persistent and bioaccumulative substances are released during incineration, or remain as residues after burning. Monitoring of releases of hazardous substances through burning is inadequate, at best. Ashes, sometimes more toxic than the wastes burned, are often buried in landfills. In the U.S., incinerators tend to be sited in communities where disadvantaged segments of the population are located. The hazardous waste management industry propagates the notion that the use of toxic substances can continue unabated, without environmental risk. The authors recommend a moratorium on incinerators, prohibition of burning of certain substances at existing facilities and a mandatory pollution prevention program aimed at phasing out the use of hazardous materials.

3.21.4Dillon, M.M., Ltd. and Cal Recovery Systems Inc. *Composting: A Literature Study*. Toronto: Ontario Ministry of the Environment, Waste Management Branch, May 1990.

This literature review, the bulk of which focuses on large municipally managed and central systems, represents a state-of-the-art report on composting science. A discussion of solid waste collection systems and waste storage is followed by a discussion of the advantages of household source separation and collection procedures such as the wet/dry system and the separate collection of yard and garden wastes, food wastes and co-composting. A section on home composting focuses on effective pathogenic kill, odour control and constraints that will likely avoid nuisance complaints. The economics of composting are discussed and comparative cost information on selected North American compost facilities and equipment manufacturers is provided.

3.21.5Driedger, S. Michelle. *Community Involvement in the Site Selection Process: A Matter of Citizen Participation—The Manitoba Hazardous Waste Management Corporation*. Winnipeg: Institute of Urban Studies, 1991.

In this short paper the author develops the argument that by eliminating the opportunity for participation by ordinary residents of the City of Winnipeg, the Manitoba Hazardous Waste Management Corporation increased widespread distrust of the Corporation and its mandate, thus also increasing opposition to any final site designated.

3.21.6Fenton, Robert. "Integrating Environmental and Economic Decision-making for Solid Waste: Approaches, Issues and Evaluation." Winnipeg:

Working Paper No. 91-01, Department of Economics, University of Winnipeg, October 1991.

Instructed by the requirement for integrating economic development with concerns for the environment, central to the report *Our Common Future*, this paper focuses on solid waste policy and reports an initial comparison of the contribution to integrated decision-making made by two alternative approaches: the waste management plan and the waste minimalization plan. It places these two approaches in the context of full life-cycle costing, return waste flows to the environment and the concept of defensive expenditures to minimize the impact of the return flows, concluding that waste minimization is the preferred strategy. The author foresees responsibility under the alternative paradigms shifting from the municipality to the producer. The latter will possibly pay the municipality to assist in achieving mandatory waste reduction targets, which in turn would be more amenable as a result of realistic marketing strategies for recycled products. Volumetric or weight based refuse collection fees would also be appropriate as part of the strategy to encourage waste service users to reduce waste. Future research should be undertaken to evaluate the achievement of waste minimization.

3.21.7**Hegberg, Bruce A. *et al.*** *Yard Waste Programs: Existing Regulations, Collection, Composting, Compost Characteristics and Land Application*. Chicago: University of Illinois Center for Solid Waste Management and Research, School of Public Health, July 1990.

Written in response to a ban by the Illinois state legislature on disposal of yard wastes in municipal landfills (20% of volume by weight), this report contains cost data on alternative methods of disposal: land application and composting. The former has a considerable cost advantage, but depends on the market for waste. It also indicates that only very intense application improves production in the short term.

3.21.8**Jennison Donna and Lesley Millard.** "The Municipal/Industrial Strategy for Abatement." *Alternatives*, 16,1 (March/April 1989): 8-10.

In this short article on Ontario's proposed MISA program, the authors identify some of the factors responsible for tardiness in bringing the very promising program to fruition, including opposition from polluters and scepticism from environmentalists. They express concern over industry monitoring itself and over the willingness of municipalities to assume responsibility for wastes dumped into sewage systems.

3.21.9**Lang, Reg.** "Equity in Siting Solid Waste Management Facilities." *Plan Canada*, 30, 2 (1990): 5-13.

Our "throwaway culture," technical approaches to waste management, and a clash of moral universes (utilitarian vs. deontological ethics of technocrats *vs.* communities) have resulted in the contemporary waste crisis. Lang identifies ten principles to guide communities toward equitable distribution of waste management facilities: (1) all society shares responsibility for waste generation and disposal; (2) each region must take care of its own waste; (3) adverse impacts should not be imposed on communities; (4) waste management facilities must be distributed equitably throughout a region; (5) regional and inter-regional strategies must provide the context for equitable facility distribution; (6) imposition of facilities must be as voluntary as possible on the part of those taking on additional risks; (7) site selection must follow an analytically sound and politically fair process; (8) a community selected for a facility should receive firm assurance that no more will be sited there; (9) those affected should be informed and involved in facility operation; (10)

the process must have sufficient lead time for thorough consideration.

3.21.10Larsen, Ib. *Organic Wastes: A Resource or an Environmental Problem?* Local Agency of Environmental Protection, City of Copenhagen, August 1991.

An overview of European initiatives in the utilization of organic wastes, especially composting and biogas.

3.21.11Larsen, Ib and Kit Børrild. *A Coherent Regulatory System for Commercial and Industrial Wastes in the City of Copenhagen.* City of Copenhagen, Agency of Environmental Protection, 1991.

Outlines obligations of commercial and industrial waste producers, waste transporters and waste treatment plants, with special sections on the disposal of organic wastes, hospital wastes and freon. It is concluded that economic costs of compliance with waste management regulations will not be significant.

3.21.12Larsen, Ib and Kit Børrild. "Waste Management in Copenhagen: Principles and Trends." *Waste Management and Research*, 9 (1991): 239-58.

A brief history of waste management strategies used in Copenhagen Municipality, where more effective waste management has had to be implemented since the 1970s. Denmark's guiding principles of waste management are: to optimize the infrastructure of waste disposal; to minimize waste volumes; assignment of means of disposal to all waste producers; the duty of all waste producers to use the appropriate means of disposal. Copenhagen's principles of waste planning are: hazardous waste must be separated from other wastes, and be recycled or treated at separate facilities; volume of wastes must be reduced through cleaner technologies or recycling; remaining waste must be separated into combustible/non-combustible components, to optimize utilization of waste-to-energy plants and landfills.

3.21.13Levenson, Howard. "Wasting Away: Policies to Reduce Trash, Toxicity and Quantity." *Environment*, 32,2 (March 1990): 11-15, 31-36.

Considering that *per capita* manufactured solid wastes are still increasing at a rate of 1% *per annum*, there are basically two routes to go to prevent wastes from becoming a municipal responsibility: (1) manufacturers must modify product design and packaging; and/or (2) consumers must modify purchasing habits. Packaging and containers comprise on average 30% of waste by weight, paper and paper products not part of packaging another 30%, and yard wastes 20%. The author concludes that, because municipal solid waste generation is tied to social customs and personal preferences and lifestyles, efforts to reduce quantity may be somewhat more intractable than efforts to reduce toxicity.

3.21.14Manitoba, Minister of Environment. *Waste Reduction and Prevention: 1991 Strategy Report.* Winnipeg: Manitoba Environment, Waste Reduction and Prevention Branch, March 1991.

The first annual strategy report following the publication of the *Waste Minimization Action Plan* in May 1990, the major contribution of this report is to summarize actions taken and contemplated subsequent to the enactment of the Waste Reduction and Prevention (WRAP) Act in August 1990. Those actions include the establishment of an Environmental Innovations Fund, establishment of a WRAP process to set waste diversion targets, the initiation of distributor WRAP committees for old newspapers, beverage containers, used oil and used tires and various information, education and outreach activities.

3.21.15Manitoba, Recycling Action Committee. *Waste Minimization Action Plan.* Winnipeg: Manitoba Environment, May 1990.

The main assertion of this Committee of the provincial Environment Department is that consideration should be given to reducing waste from the time a product is designed, during its manufacture, distribution and consumption and through its ultimate disposal. The Committee recommended two additional Rs to the usual four: residue management; and shared responsibility. The report includes 56 recommendations to the government.

3.21.16Metropolitan Toronto, Regional Municipality of. *Metropolitan Toronto Solid Waste Management Master Plan.* Toronto: Office of the Metropolitan Clerk, September 1991.

Prepared as part of the solid waste environmental assessment plan required of municipalities under Ontario's Environmental Assessment Act, this most comprehensive of plans details the strategies and facilities required to reduce sanitary landfill disposal by 90% by the year 2030. The plan assumes that voluntary compliance, assisted by public regulation as required, will reduce packaging weight by 65%, that some 10% of waste will be re-used, that recycling will prove 100% effective for recyclables and that 100% of yard and kitchen waste will be composted, either in individual gardens/bins or in centralized facilities. Costs, including land acquisition for new transfer and steam generation facilities, over a 20 year period, are estimated at about $300 *per capita*, or $650 million.

3.21.17Miller, C. "Efficiency, Equity and Pollution: The Case of Radioactive Waste." *Environment and Planning*, 19 (1987): 913-24.

The absence of compensation for third party victims of residual pollution may entail a violation of Rawls' second principle of justice. Environmental pollution, in so far as it is uncharged cost, may also lead to an inefficient distribution of goods and services.

3.21.18Miller, Peter. "The Place of Recycling in Sustainable Development." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers.* Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 39-62

Recycling is a crucial strategy for building a sustainable conserver society, not an end in itself. It is vital, therefore, to understand the important values and goals that recycling is supposed to serve in order to appreciate the point and urgency of conservation and recycling tactics and to be able to evaluate wisely alternative industrial and economic policies and practices. The recycling philosophy sketched imbeds human recycling activities in an ecological perspective and enunciates the two fundamental *principles* by which we may evaluate our coexistence with other living things and our utilization of resource: the Biosphere Preservation Principle and the Resource Stewardship Principle. These principles are the basis of more specific *guidelines* for effective social institutions and practices. However, there are barriers to recycling which must be overcome. (Abstract provided by the author).

3.21.19Moher, Frank. "Doctored Strange Stuff." *West* (April 1990): 11-13.

This brief article describes one man's "change of heart" regarding the Swan Hills, Alberta hazardous waste management facility. In 1981, when the plant was first proposed, Derek Kool, a Swan Hills convenience store owner, was vehemently opposed to the facility; in 1989, he sold the business, and went to work in the plant, citing his earlier attitude as "narrow-visioned" and "biased." The account of "what goes on" inside the plant—North

America's first integrated hazardous waste treatment and disposal facility—is especially interesting. Although Swan Hills is a relatively small (population 2500) and remote community (200 km northwest of Edmonton), similar site selection processes are now being used in urban areas (e.g., Winnipeg), where the majority of toxic wastes are generated (and dumped). For a fuller account of the site selection process, see Jennifer McQuaid-Cook and Kenneth J. Simpson, "Siting a Fully Integrated Waste Management Facility in Alberta," *Journal of the Air Pollution Control Association*, 36,9 (1988): 1031-36.

3.21.20**Novek, Joel and Karen Kampen.** "Hard Copies, Hard Choices: Paper Pollution in the Information Society." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 87-118.

This paper deals with the (ironically) increased use of paper products resulting from electronic communications, and the destruction of the boreal forest in order to serve the insatiable need of urban centres for paper. In particular, the Repap situation in Manitoba is discussed. This kind of development, which saps the countryside in order to meet the unnecessary demands of dependent cities, the authors conclude, runs counter to the principles of sustainable development. (Abstract provided by the authors).

3.21.21**Ontario, Recycling Council of.** *Who Should Pay for Recycling?* Toronto: Discussion Paper, The Council, 1990.

This discussion paper, undertaken in the face of generally decreasing and unstable prices for blue box products, recalls the basics underlying the blue box recycling program in Ontario. Industry, whose responsibility it is to assure that packaging materials and non-reusable products are either recycled or disposed of, has not lived up to its commitment to underwrite the cost of the blue box program, either by direct transfer of funds to the government and then to the Council or by purchasing blue box contents at prices that permit cost recovery. The report concludes by suggesting that municipalities should use their right to collect materials that are too costly.

3.21.22**Platt, Brenda, *et al.*** *Beyond 40 Percent: Record-Setting Recycling and Composting Programs*. Washington, DC: Island Press, Institute for Local Self-Reliance, 1991.

Based on 17 case studies of communities that recovered 40% or more of residential solid waste tonnage, this book addresses the question of how to achieve very high levels of materials recovery through the collection of source-separated materials. It concludes that only mandatory programs and voluntary programs with economic incentives have high success rates. The importance of aggressively pursuing composting and targeting a variety of materials is also observed.

3.21.23***Profit from Pollution Prevention: A Guide to Waste Reduction and Recycling in Canada.*** 2nd edition, revised. Toronto: Pollution Probe Foundation, 1990.

This is a practical manual for companies that wish to set up waste reduction programs of their own. Part I discusses the steps involved in setting up a waste reduction program. Part II details government requirements and assistance resources, and other professional and technological aids. Examples of companies that have "profited from pollution prevention" are provided. An Appendix on analysing costs and a select bibliography conclude the handbook.

3.21.24**Seldman, Neil and Jon Huls.** "Community Development and Recycling." *Resource Recycling* (January/February 1984):

38-39.

A report on Minneapolis-St. Paul's Recycling Unlimited, a successful, non-profit community recycling program.

3.21.25Ward, Harold R. and Robert W. Kates. "Will Rhode Island Be the First Green State?" *Environment*, 32,8 (October 1990): 11-15, 34.

This short article draws the important distinction between sustainability and green. Public education has played a major role in reducing solid waste generation. Recycling has reduced solid waste generation by 14%, and the authors assert that user fees could reduce this amount by one half.

3.21.26Winnipeg, City of. *Waste Minimization Study*. Winnipeg: Waterworks, Waste and Disposal Department.

This study, conducted for the department, makes a number of recommendations for reduction of solid waste for the City of Winnipeg, including development of procurement policies that are preferential towards materials that encourage reuse and recycling, a program of in-house waste stream segregation for municipal government, providing back yard composting units for Winnipeggers on a subsidized basis, demonstration program support for wide-scale curbside blue box collection programs, and increases in landfill fees to provide a fund to support solid waste minimization and recycling activities.

3.21.27Wynne, B. *Risk Management and Hazardous Waste: Implementation and the Dialectics of Credibility*. Berlin: Springer, 1987.

Using case studies, this volume is an excellent documentation of the problems stemming from the interaction between the institutional setting, human behavioral factors and technical knowledge.

3.22 *Water Quality*

3.22.1American Planning Association. "Residential Density and Groundwater Contamination." *Zoning News* (April 1986).

In an exhaustive 1978 study of nitrate pollution of water resources, the U.S. National Academy of Sciences concluded that, "the only feasible means of controlling nitrate output from septic tank disposal is through proper land use and zoning controls which . . . limit the density of housing." This issue summarizes the findings of that study.

3.22.2Barnes, D. and P.J. Bliss. *Biological Control of Nitrogen in Wastewater Treatment*. London: E. and F.N. Spon, 1983.

The problems caused by the presence of nitrogen, which is present in almost all wastewater, include toxicity to aquatic life, depletion of oxygen, danger to infant users, and excessive growth of plant life and algae. Biological processes generally provide the most economic means for controlling nitrogen. This book presents a comprehensible summary of the theory and practice of these biological processes for scientists in wastewater management.

3.22.3British Columbia, Roundtable on the Environment and the Economy. *Sustainable Land and Water Use*. Vancouver: The Roundtable, 1991.

This paper's most significant contribution to the concept of sustainable development is in its prescriptions for the future: integration in planning; improving public involvement; restructuring laws and institutions; careful and effective implementation of plans; and decisions by consensus.

3.22.4Canada, Department of the Environment, and Canadian Water and Wastewater Association. ***What's New in Wastewater Technology?*** Ottawa: Background Papers for a Technology Transfer Seminar Series, Environment Canada, 1988.

Containing nine papers on such subjects as measuring water quality in wastewater treatment plants, conserving energy, polymer additives for sewage sludge, conversion of sludge to oil, assessing alternative mixer configurations and removal of suspended solids and waste metal, this report represents state of the art work sponsored by the Wastewater Technology Centre.

3.22.5Dobson, Stephen. *Water Conservation for Alberta: Techniques and Experiences.* Edmonton: Alberta Environment Planning Commission, March 1990.

Building on previous studies, this report concludes that, given the average values of water for municipal, irrigation, industrial and recreational users, current policy pertaining to the allocation of water seems to minimize the social benefits of water use. Municipalities use the lowest volume, but have the highest valued use. Agriculture uses the maximum volume of water and has the lowest total value of water, as well as a high proportion of wastage. The travel cost and contingent valuation methods are recommended for estimating the value of water for recreational purposes.

3.22.6Carlisle, Thomas J. and George Mulamootill. "Artificial Wetlands for the Treatment of Storm Water." *Canadian Water Resources Journal*, 16,4 (Winter 1991): 331-46.

One of only a few non-technical Canadian articles that addresses jointly the issues of storm water and water quality, the authors propose that artificial wetlands be examined as a policy alternative to retention ponds, the traditional alternative to expensive and large storm water trunk sewer construction. Natural wetlands are not appropriate, as they are subject to damage from storm water runoff. Constructed wetlands may be dredged and harvested as required.

3.22.7Ferguson, B.K. "Urban Stormwater Harvesting: Applications and Hydraulic Design." *Journal of Environmental Management*, 25 (1987): 71-79.

This short article explores the uses and techniques of water harvesting, the collection of rainfall runoff for use. Uses to which runoff can be immediately put include irrigation and pond supply. The main system design impediment is collection during storms.

3.22.8Fortin, M. and Mitchell, B. *Water and Wastewater Charges for Ontario: The User Pay Principle.* Toronto: Ontario Sewer and Watermain Contractors Association, October 1990.

Commencing from the premise that pressures exist to address concerns with toxic drinking water contaminants and to finance investments in new water and wastewater capacity, this study reviews the various ways and means by which additional funds might be raised from increased and new user charges. The authors conclude with recommendatiors for phasing out existing grant programs, for integrating water supply and wastewater financial systems and for a new regulatory agency for water and wastewater rates.

3.22.9George, Georgescu Ranjit Varkki. "Is Ground Water Regulation Blindman's Bluff?" *Journal of Planning Literature*, 3,2 (1988): 231-43.

The author cites a voluminous body of literature that leads him to conclude that septic tanks and cesspools as the second most serious water contaminant after industrial wastes.

However, it is difficult to compare contaminants. Understanding the ways in which contaminants reach aquifers is critical.

3.22.10**Gurney, Sharon.** *Proposed Water Quality Objectives through Manitoba's Watershed Classification Process: Red and Assiniboine Rivers and their Tributaries Within and Downstream of the City of Winnipeg*. Winnipeg: Manitoba Environment, Environmental Management Section, Water Quality Management Section, July 1991, Summary Document, Technical Document and Technical Appendix.

These documents contain the Department's background report on water quality in streams in the Winnipeg region. The reports indicate that there are three treatment plants, 41 combined sewer outfalls, 75 other major municipal drainage outfalls, as well as large numbers of industrial waste discharges in the Winnipeg region. Detailed data indicate that the two major rivers contain good quality water upstream of Winnipeg and that the very low quality water in Winnipeg, and downstream of Winnipeg, is due mostly to the above discharges within the city and region.

3.22.11**I.D. Engineering Co. Ltd., *et al.*** *Stormwater Management Guidelines for the Province of Alberta*. Edmonton: Alberta Environment, March 1987.

Contains a review of stormwater management systems across Canada, as well as guidelines for future rural and urban development of systems in Alberta.

3.22.12**Kelly, Harlan G. and Jack M.R. Bryck.** "Understanding the Use of De[illegible] in Stormwater Management." *Canadian Water Resources Journal*, 12,1 (1987): 78-88.

Adequate maintenance of retention ponds is essential if both the public and private investment in them is to be safeguarded.

3.22.13**Lockery, Andy.** "The Rivers of Downtown Winnipeg—An Environmental Assessment." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers*. Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 63-72.

Rivers in an urban landscape fulfil many needs, from drinking water to recreational activities to sewage disposal. Many of these uses conflict, and yet most co-exist. This paper examines these conflicts as they exist in Winnipeg, with reference to the various uses of the Assiniboine and Red Rivers, both current and in the future. (Abstract provided by the author).

3.22.14**MacLaren, James F. Ltd.** *Water and Waste: A Background Paper on Water Pollution Control, Water Supply, Land Drainage and Solid Waste Disposal in the City of Winnipeg*. Winnipeg: Tri-Level Committee on Urban Affairs, 1978.

This very comprehensive review of the performance, characteristics and needs for the Winnipeg region is of considerable value for those needing a thorough explanation for these systems, as well as those embarking upon a review of subsequent events and needs in the region.

3.22.15**MacLaren, James W.** *Municipal Waterworks and Wastewater Systems*. Ottawa: Inquiry on Federal Water Policy, 1985.

This background paper documents the extent of municipal sewage treatment in Canada, concluding that the plants and systems that serve two-thirds of Canadians are seriously in need of rehabilitation whose price likely is at least $100 billion. The report recommends that the federal government, jointly with the provinces, develop

programs to stimulate municipal spending in this area.

3.22.16Mathur, Brijesh. "Conserving the Urban River Corridor: Experience from Saskatoon." *Plan Canada*, 29,5 (1989): 43-49.

The author notes that Saskatoon provides one of the few examples of a Canadian city attempting to improve the quality of the stream running through it. The provincial government has established a special purpose authority to implement a 100-year conceptual plan. While the new authority has formal powers over the City of Saskatoon, it has often had to bow to municipal decisions which it opposed because the elected council is viewed as having greater legitimacy by the public at large. The City's pollution control plant is also exempt from regulation by it.

3.22.17Mathur, Brijesh and Mary Ann Beavis, eds. *Towards Stewardship of Winnipeg's River Corridors: Conference Proceedings (Second Winnipeg Rivers Conference).* Winnipeg: Institute of Urban Studies, 1989.

In his introduction, co-editor Mathur sets forth the need for vision, the settlement of jurisdictional issues, the formulation of conservation and development objectives, the settlement of disagreements among users, the lessons to be learned from other Canadian cities and, finally, the need for greater co-operation before tentative provincial plans to establish a corporation can be finalized. In his introduction to the conference, Manitoba's Minister of Urban Affairs tabled plans for the establishment of the riverfront corporation. Speaking for the Manitoba Association of Rural Municipalities, Winnipeg Region, and one of the proposed partners in the establishment of the riverfront corporation, its chairperson stressed the need to involve rural municipalities. The co-ordinator of The University of Winnipeg's Environmental Studies Program summarized the environmental challenge facing the riverfront corporation. His scientific appraisal was that the principal environmental problem to be faced by the new corporation is pollution of the rivers by Winnipeg sewage and runoff. The construction of the necessary public works might be prohibitively expensive, while the much cheaper further chemical treatment of effluent is potentially harmful to the environment. He suggests the construction of holding tanks for excess runoff during heavy rains, to be treated as water flows allow. Kenneth P. Pontikes (Meewasin Valley Authority) and Richard Scott (National Capital Commission) presented experiences from Saskatoon and Ottawa.

3.22.18Morris, John R. "Water Conservation Progress in Denver." *Contemporary Policy Issues: Economic Analyses for the Decision-Maker*, 9,3 (July 1991): 35-45.

One of many articles addressing the issue of urban water demand management, the author notes that policies already adopted have reduced final demand by 10-15% and that future policies along the same line could have a similar effect on future demand, postponing major new supply projects indefinitely. Usage in 1982 was 212 gallons per day *per capita*, and 1999 projection is 184-173 gallons per day *per capita*.

3.22.19Muldoon, Paul and Carole Saint-Laurent. *Turning Off the Tap: Water Conservation Law in Ontario*. Toronto: Canadian Institute for Environmental Law and Policy, July 1990.

Starting from the premise that the increasing demand for fresh and wastewater services will exceed resources in the future, this paper focuses on water regulation and conservation strategy. It reviews the legislation, policies and programs which govern water conservation in Canada and in Ontario. The third part examines relevant laws, policies and programs with a view to identifying the extent to which they provide vehicles for, or barriers to, the adoption and

implementation of water conservation measures. The fourth part contains recommendations for the future.

3.22.20Pearse, P. *et al.* *Currents of Change: Final Report of the Federal Inquiry on Water Policy*. Ottawa: Environment Canada, 1985.

This landmark study for the federal government emphasized the need for Canada to depart from its tradition of supply management in favour of responding to growth by demand management. Other recommendations range from improved regulation of domestic plumbing, improved irrigation methods and innovative pricing structures. It contains excellent resource and bibliographic sections.

3.22.21Rawson Academy of Aquatic Science. *Towards "User Pay" for Municipal Water and Wastewater Services*. Ottawa: The Academy, 1990.

Based on a workshop held in Toronto in co-operation between the Academy and the Canadian Water and Wastewater Association, these proceedings contain five main papers presented to the workshop, as well as extensive commentary based on the submissions. In addition to urging that Canadian municipalities move in the direction of a market approach to demand management, noting along the way that municipal revenues for water and wastewater now approximate 50% of annual costs of operation and capital improvement, workshop presenters and participants also favoured further development of conservation plumbing and regulatory tools.

3.22.22Prasad, Braj B. "Stormwater Lakes—A Recreation Amenity: Beaumaris Lake—A Case Study" and idem *et al.* "The Recreation Function of Beaumaris Lake." *Canadian Water Resources Journal*, 12,3 (1987): 59-66, 48-58.

The first article stresses both the capital savings and recreation and aesthetic function of retention ponds, although municipal policy is that lakes are not suitable for contact recreation in summer. The second article results from a survey of nearby and adjoining residents and evidences both the recreation and aesthetic value of the lake in Genstar's Castle Downs development in Edmonton.

3.22.23Tate, D.M. *Water Demand Management in Canada: A State of the Art Review*. Ottawa: Environment Canada, Inland Waters Directorate, Water Planning and Management Branch, Social Science Series No. 23, 1990.

This paper presents an in-depth review of water demand management, defined as any socially beneficial measure that reduces or reschedules average or peak withdrawals, with emphasis on Canadian applications. The theme is developed for four sectors: municipal, industrial, agricultural and non-withdrawal uses. In the case of the municipal sector the paper focuses on pricing. It also emphasizes pricing as a way to manage effluent quantity and quality from industrial uses. With respect to agriculture the author concludes that public policy has sanctioned subsidies for irrigation, almost all of it on the Prairies and largely ignored matters of resource economics.

3.22.24Viessman, Warren Jr. "Water Management." *Environment*, 32,4 (May 1990): 11-15.

The author argues in this brief article that the primary cause of inaction, as well as perhaps the most troublesome issue, with respect to improving water quality is risk. Future research agendas should focus greater attention on decision-making in the face of risk.

3.22.25Walters, Patrick and Jong Huang. *A Water Consumption Model for the City of Edmonton: An Update*. Edmonton: City of Edmonton Environmental Services Department,

Research Paper No. 31, June 1989.

The authors estimate significant parameters in water consumption—number of customers, average April-September temperature, water rates, interest rate and increase in day time housekeepers—with the assistance of regression equations, and project water demand into the future on this basis.

3.22.26**Williamson, D.A.** *Manitoba Surface Water Quality Objectives*. Winnipeg: Manitoba Environment, 1988.

A report of the Water Standards and Studies Section of Manitoba Environment, this report sets forth the province's standards for six classes of intended uses of surface water and the rationale underlying the standards.

4 The State of Urban Sustainability

4.1 *Canada*

4.1.1**Canada, Department of the Environment.** *The State of Canada's Environment*. Ottawa: Minister of Supply and Services Canada, 1991.

The second national state of the environment report, this volume contains references throughout to environmental degradation in urban centres, as well as a chapter devoted to urbanization and environmental degradation. Topics covered include impact of urbanization on air and water resources, energy use and waste disposal, and urban form and the environment. Regional case studies for the Lower Fraser River basin, Prairie grasslands, Great Lakes basin and St. Lawrence River also contain extensive discussion of urbanization and its impact on the environment in those regions.

4.1.2**Dale, Lynne and Thomas L. Burton.** "Regional Planning in Alberta: Performance and Prospects." *Alberta Journal of Planning Practice*, 3 (1984): 17-41.

This article comprises a summary, as well as the personal conclusions, of the Regional Planning Perspectives Study, carried out by the authors for the Ministry of Municipal Affairs. The authors undertook structured interviews with professional planners employed and not employed by the commissions, professional developers, and leaders of citizens' groups. Municipal and provincial staff involved in planning in Alberta were the subjects of a separate study. The interviews were analyzed using manifest and latent content analysis. As a whole, developers were wary of the subdivision approval powers possessed by the regional commissions. They pointed to the conflict this entails with plan formulation and approval, the lack of political accountability of the commissions once appointed, and the bureaucratic rigidity with which the commissions

carried out this function. Planners were on the whole satisfied. Citizen leaders were largely unaware of the work of the commissions. The authors conclude on a pessimistic note with respect to anticipated future prospects for the ability of regional commissions to carry out their mandate. They note the demotion of plans from precise regulatory instruments dictating municipal decisions to "guidelines", and they note the potential for local municipalities to usurp the subdivision approval process from the commissions.

4.1.3Lerner, Sally and Carolyn Oster. "Conservative Traditions and Ecocommunity Beginnings in Kitchener-Waterloo." *Alternatives*, 12,3/4 (1985): 46-50.

An account of programs and policies that make Kitchener-Waterloo a pioneer in environmentally sensitive, conservation-oriented local development, including social, environmental, economic and political initiatives. "Conserver initiatives" in the areas of employment, housing, food, water conservation and waste management are described.

4.1.4Maclaren, Virginia W. *Sustainable Urban Development in Canada: From Concept to Practice*. 3 Volumes. Toronto: ICURR Press, February 1992.

This report, prepared for the Intergovernmental Committee on Urban and Regional Research (ICURR) reflects recent sustainable urban development (SUD) initiatives in Canada, based on interviews with officials from 23 Canadian urban municipalities, conducted in 1990-91. At least one municipality from each province or territory is included. The first volume (*Summary Report*) explains the purpose of the project and the methodology used, and summarizes and analyzes the results of the research. Volume II is a brief (43-item) annotated bibliography on SUD. The third volume (*Compendium of Initiatives*) forms the bulk of the report (275 pages), and lists SUD initiatives (either being implemented or in the conceptual design stage) administered by municipal departments, by city, from West (Victoria) to East (St. John's), as well as in the North (Whitehorse, Yellowknife). The SUD initiatives identified for each municipality flow from definitions of sustainable urban development generated by the municipal officials interviewed. To date, this report is the best reflection of the state of urban sustainability in Canada available.

4.1.5Macpherson, A.S. *Toronto: State of the Environment*. Toronto: City of Toronto Department of Public Health, May 1988.

The first state of the environment report for a Canadian municipality, this report still provides an excellent model for emulation by others, focusing as it does on air, water and land degradation. While it is an excellent report on the environment, it does not treat the larger issue of sustainability.

4.1.6Peterson, Lorne. "An Ecological Portrait of the Ottawa-Rideau-Gatineau Region: A Project for the People and the Land." Project Proposal, Ottawa, January 1990.

This is a proposal for a comprehensive state of the environment (SOE) review of the Ottawa-Rideau-Gatineau bioregion (Ottawa-Carleton area). The four basic aims of the project are: to make an aesthetically and ecologically sensitive portrait of the region; to identify regional ecosystems and their effects on human and non-human life; to assess the environmental, human and economic health of the area; to identify designs and plans for healthy urban ecosystems. The four main themes of the project are: Where We Live, Environmental Conditions and Trends, Institutions and Community Responses, and Ecological Designs for Living. The final publication is to be composed of 15 booklets, reporting, in story

form, on various topics relevant to bioregional issues, e.g., "Native Ways of Life: The People and the Land"; "Urban Ecology"; "State of the Environment Reporting"; "The Soundscape"; "Urban Waste Matters"; "City Service Infrastructures." For further information, contact: Lorne Peterson, 588 Cole Ave., Ottawa, Ontario, Canada K2A 2B5.

4.1.7Saarinen, Oiva. "Urban Restructuring and Revitalization: The Sudbury Case Study." In Mary Ann Beavis, ed., *Municipal Development in Northeastern Ontario: Copper Cliff and Sudbury*. Occasional Paper 26. Winnipeg: Institute of Urban Studies, 1991, pp. 25-43.

An account of the recovery of the declining resource community of Sudbury, which adopted a sustainable development strategy, enshrined in its official plan, including "greening" initiatives and regional economic development, in order to reverse its dependence on exogenous forces.

4.1.8Smith, Desmond. "Local Area Conservation: How One Suburban Municipality Utilizes Environmental Planning to Conserve its Natural Heritage." *Plan Canada*, 29,5 (1989): 39-42.

In the late 1960s, North Vancouver hired several consulting firms to undertake environmental studies for its Landscape Reconnaissance Program, designed to foster environmentally sensitive development. The municipality of Seymour was the first to benefit from the "design-with-nature" approach that resulted from the landscape reconnaissances. Prime natural areas were earmarked for preservation, and the remaining developable land was divided into design parcels delimited by natural features. The author notes some distrust of this new form of development by local residents, since it deviated from their preconceptions about what a suburban subdivision should look like, and it was presumed that conservation pertains only to wilderness areas.

4.1.9Tomalty, Ray and Sue Hendler. "Green Planning: Striving Towards Sustainable Development in Ontario's Municipalities." *Plan Canada*, 31,3 (1991): 27-32.

This article reviews sustainable development initiatives in five Ontario municipalities: Ottawa; Regional Municipality of Ottawa-Carleton; Sudbury; Region of Hamilton-Wentworth; Peterborough; Region of Waterloo. These municipalities are using various mechanisms to implement sustainable development principles: a budgetary process that incorporates environmental considerations (Hamilton-Wentworth, Waterloo); official plans (Ottawa, Sudbury, Waterloo, Hamilton-Wentworth); environmental impact assessment (Ottawa, Waterloo); State of the Environment (SOE) reporting (Waterloo, Hamilton-Wentworth, Ottawa-Carleton); healthy community project (Ottawa-Carleton); municipal round table on the environment (Peterborough). To date, these initiatives have resulted mostly in internal study and public activity, with little real policy change. This can be attributed to the influence of developers on municipal councillors, the asymmetry between highly visible development benefits and widely dispersed environmental costs, the "sheer inertia" of city bureaucracies, and the lack of municipal environmental departments. The authors suggest that progress can be made through increased public pressure on urban governments, the integration of disparate efforts such as round tables on the environment, healthy communities projects and sustainable development advisory committees, inter-municipal networking on sustainable development strategies, and reforms within city governments (e.g., municipal environmental protection agencies, explicit conservation mandates for all departments, local government support for environmental policies and programs not usually regulated by municipalities—packaging regulations, banning junk mail, air quality standards, etc.).

4.1.10Urban Environment Sub-Committee of the Public Advisory Committees to the Environment Council of Alberta. *Environment by Design: The Urban Place in Alberta.* Edmonton: Environment Council of Alberta, 1988.

This report likens human communities to biological ecosystems, which need diversity in order to survive. An overview of urbanization in Alberta is given, with reference to critical urban environmental issues (disease, safety, the indoor environment, noise, waste management, transportation, open space preservation, the outdoor built environment). Interactions between the city and the hinterland are enumerated. In conclusion, urban management and the decision-making process are discussed.

4.1.11Waterloo, Regional Municipality of. *State of Environment Report.* Waterloo: Department of Planning and Development, Regional Municipality of Waterloo, December 1991.

Representing a recent evolution of municipal state of the environment reports, this report focuses on the sustainability of both human and natural ecology and the relationship between them, in addition to the degradation of land water and air. It is also innovative in projecting alternative future conditions.

4.1.12Wichern, Philip H. "Sustainable Development and Urban Policy in Winnipeg." In Mary Ann Beavis, ed., *Ethical Dimensions of Sustainable Development and Urbanization: Seminar Papers.* Occasional Paper 23. Winnipeg: Institute of Urban Studies, 1990, pp. 73-94.

The purpose of this paper is to explore the nature and significance of sustainable development—especially ethical dimensions—to the development of urban policy in Winnipeg. The first point made is that there are very important reasons for undertaking this exploration, including the unfinished task of relating sustainable development to urban development and settlement, the focus of federal and provincial governments on sustainable development (including the Sustainable Development Institute), and the potential payoffs for the province and the city in becoming a centre of urban sustainable development research and practical applications. A second section of this presentation assesses the degree to which sustainable development has been carefully considered and integrated into city and provincial urban policymaking in Winnipeg. As well as recycling and waste management, this review also evaluates urban planning (including Plan Winnipeg), land use regulation (including the Urban Limit Line), and the recent economic development studies and proposals. A third and final major section will explore the ideas and practices in Winnipeg—by the City of Winnipeg, by the Province, and by the Sustainable Development Institute (funded by all levels of government and the private sector) which is located here. (Abstract provided by the author).

4.1.13Williams, Deborah. "Planning for Our Tomorrows: The Ecosystem Approach and the Greater Toronto Bioregion." *Plan Canada*, 31,5 (1991): 25-31.

A progress report on the Royal Commission on the Future of the Toronto Waterfront, which has taken a bioregional (ecosystem) approach to planning for the Greater Toronto Bioregion.

4.2*International*

4.2.1Association of Netherlands Municipalities. *Municipal Environmental Policy in the Netherlands: Setting Out for Sustainable Development.* The Hague, 1990.

This 16-page booklet introduces the National Environmental Policy Plan of the Netherlands, and gives examples of how municipalities have

implemented—or surpassed—national environmental policy locally in the following areas: traffic and transport; ecological urban greenery management; protection of rural areas; environment-friendly housing; animal waste; soil protection; enforcement and environmental control in industry; separate refuse collection and recycling.

4.2.2*Denmark Review*, 1 (1992).

This issue of the magazine of the Royal Danish Ministry of Foreign Affairs features brief articles on environment, energy and biotechnology. Highlights are items on eliminating paper from the office, wind power, and low-energy, lower pollution housing, constructed with non-polluting materials.

4.2.3*The Environment and Public Health Administration in Stockholm*. Stockholm: Environment and Public Health Administration, 1990.

A booklet outlining the responsibilities of Stockholm's Environment and Public Health Administration, which include monitoring (an ameliorating) air and water quality, waste handling (including recycling and hazardous waste; most of Stockholm's domestic waste is burned for heat and electricity); animal welfare; noise; indoor environment (including radon testing); consultation with physical planning authorities; food quality; industrial activities; and medical matters. The Administration is responsible for producing an Environmental Plan every five years.

4.2.4**Lord Mayor's Office, Department of Urban Planning.** *Energy & Environment in Copenhagen*. Copenhagen Municipality, n.d.

Outlines Copenhagen's commitment to planning and environmental protection, within the context of Denmark's "Action Plan for Environment and Development," in the areas of energy supply, water supply, sewage and waste water treatment, refuse treatment, refuse depots, pollution from industry and installations and traffic pollution. "Urban ecology" is identified as the framework within which planning measures should be undertaken.

4.2.5**Johnson, Roger**. "The 'Green City' Concept: Proposals for Auckland, NZ." *Town Planning Review*, 55,3 (1984): 290-312.

This article describes a Green City strategy designed and implemented by the Auckland Regional Authority. The Green City principles acted upon are: the enhancement of public transit, especially electric vehicles, and the encouragement of cycling and walking; urban forestry; and urban infilling. At the time of writing, these measures had been partially implemented. The author calls for the application of Green City principles worldwide.

4.2.6**Stren, Richard, Rodney White and Joseph Whitney, eds.** *Sustainable Cities: Urbanization and the Environment in International Perspective*. Boulder/San Francisco/Oxford: Westview Press, 1992.

The papers in this anthology were orginially presented at a colloquium on "Human Settlements and Sustainable Development" held at the University of Toronto in June 1990. The papers are regional overview essays on the environmental impact of urbanization in Canada, the United States, South East Asia, Japan, Latin America, Eastern Europe, Africa, Western Europe and Hong Kong and China. A common theme that emerges from the papers on the sustainable development (or lack thereof) in LDCs is the severe environmental impact of poverty, and the devastating effects that global climate change may have in these areas. With such pressing social problems, Third World nations have little incentive to address environmental issues, although changes brought about by increased temperatures and elevated sea

levels may affect many of them drastically. A movement toward global equity is prescribed as a preventative measure to hold off further environmental degradation, and to enable nations to compensate for the effects of global warming. Highlights of the proceedings are Nigel Richardson's discussion of environment and urbanization in Canada; Tjeerd Deelstra's regional overview of Western Europe, especially the interesting section on the environmental impacts of housing; and the overview paper by Rodney White and Joseph Whitney, which places sustainable urban development within a global historical, ecological and economic framework, and thoughtfully examines policy options for the future. Sustainable urban development strategies must go beyond piecemeal programs and approaches (recycling, pollution control, etc.), and even surpass "green city" and "healthy city" policies, to globally oriented social, political and economic reforms.

4.2.7van Vliet, Willem. *Human Settlements in the U.S.: Sustaining Uneven Development.* Research Paper 183. Centre for Urban and Community Studies, University of Toronto.

The author, who teaches at the University of Colorado, argues that since threats to sustainable development (defined as environmentally sound development) in the U.S. are unevenly distributed, the cost of environmental improvement may be regressive. Sustainable development, it is argued, is a normative (value-laden) concept that should be broadened to include equity considerations, which should extend to the international context.

4.2.8Vickers, Graham. "Green Politics." *Architect's Journal*, 183,6 (1986): 64-65.

A brief, but incisive analysis of the environmental policies of four U.K. political parties: the Greens, SDP, Liberals and Conservatives. The SDP's white paper, *Conservation and Change*, scores highest, in the author's opinion. A classic quotation from a Tory policy study is: "Communities invariably, though not always, exist in a particular physical environment."

4.2.9"Vision of a Green and Pleasant Land." *Architect's Journal*, 183 (6): 52-63.

A report on urban greening initiatives in the West Midlands, an economically depressed, post-industrial county in the U.K. Land reclamation, and community involvement in green city projects, is conceived as a method of improving the image of the area, both for residents and for potential investors. Public money spent on such projects, the author argues, is not "throwing money away," but a way of "spending better."

4.2.10World Resources Institute. *World Resources, 1987: An Assessment of the Resource Base That Supports the Global Economy*. New York: Basic Books, 1987.

The first of a series of publications directed at monitoring world environmental issues, it contains data from 146 countries and chapters on population and health, human settlements, food and agriculture, forests and rangelands, wildlife and habitat, energy, fresh water, oceans and coasts, atmosphere and climate, global systems and cycles, and policy and institutions.

5 Plans and Strategies for Sustainable Cities

5.1Allen, Greg *et al.* "Greenlands: A Sustainable Development Plan, Toronto's Waterfront Railway Lands." Toronto: Office of the City Clerk, City of Toronto, October 21, 1990.

Prepared by a small group of citizens for presentation to the City Council of Toronto, this short report contains sustainable development principles that the group wanted included in the City's plans for developing nearly 200 acres of railway lands adjacent to the core area. Principles proposed include the minimization of fossil fuel consumption, the absence of peak drain on hydro production, reduction of CO_2 emissions, incorporation of solar aquatic engineering systems (roof-top greenhouse treatment of sewage), construction of retention ponds for storm water runoff where possible, and reduction in parking requirements.

5.2Berg, Peter, Beryl Magilavy and Seth Zuckerman. *A Green City Program for the San Francisco Bay Area and Beyond.* San Francisco: Planet Drum Books, 1990.

This is a handbook of "green city" strategies for implementing sustainability in San Francisco, conceived as a part of the Northern California bioregion. However, the ideas introduced in the book are adaptable to a wide variety of cities and communities. This book is the result of a series of public meetings held in San Francisco by the Planet Drum Foundation to develop proposals for a program to prevent regional deterioration and to enhance local self-reliance.

Each chapter covers a specific "sustainable city" practice: urban planting; smart transportation; sustainable planning; renewable energy; neighbourhood character and empowerment; recycling and reuse; celebrating life-place vitality; urban wild habitat; socially responsible small businesses and co-operatives. Chapters are organized under the following headings: The way it is now; What do we mean by [e.g., urban planting]?; What benefits can we gain from [e.g., urban wild habitat]?; What can cities do to promote [e.g., renewable energy?]; Longer-term visions for municipal action; Related fields; and "A fable" (an example, usually based on real-life experience, of the implementation of a "green city" stratagem). The final chapter, "Green City Realities," gives concrete examples of green city schemes functioning in various communities.

5.3Brooks, David B. Roger Peters and Paul Robillard. "Pricing: A Neglected Tool for Managing Water Demand." *Alternatives*, 17,3 (November/December 1990): 40-48.

The authors provide an excellent summary of the impact of water pricing on water demand and a typology of various pricing mechanisms and their goals and objectives. The notion of "life line" rates is introduced in the latter, and the appropriateness of an increasing block rate structure for recovering the marginal cost of peak use is discussed. The notion of metering separately for waste water flow is discussed in the context of the marginal costs of treatment and as a mechanism for promoting conservation, especially of gray water, is introduced.

5.4Calgary Regional Planning Commission. *The Calgary Regional Plan.* Calgary: Calgary Regional Planning Commission, Office Consolidation, including all amendments to August 10, 1988.

While the plan permits the severance of up to one residential lot per quarter section, it also directs that no subdivision be included in agricultural land of high value.

5.5Canada and Ontario, Royal Commission on the Future of the Toronto Waterfront. *Watershed.* Toronto: Royal Commission, Interim Report, August 1990.

Originally named to be the chairman and only commissioner by the Government of Canada, David Crombie was later requested by the Government of Ontario to chair a joint royal commission. This report outlines the ecosystem approach taken by the Royal Commission and outlines its principles—clean, green, usable, diverse, open, accessible, connected, affordable and attractive—and recommendations for the future uses of the Greater Toronto Area's waterfront. The report was preceded by a previous interim report in the summer of 1989 and by ten background reports, also available from the Royal Commission.

5.6**Canada Mortgage and Housing Corporation.** *Strategic Plan, 1992-1996*. Ottawa: CMHC, 1991.

Prepared annually for the subsequent five-year period in recent years, this edition of the strategic plan includes a section on sustainable development for the first time.

5.7**Chesapeake Bay Commission.** *Protecting the Future: A Vision for Maryland*. Baltimore: Maryland Office of Planning, January 1991.

This brief report focuses primarily on the preservation of agricultural land in Maryland and puts forth a strategy, labelled "managed growth", for reducing future urban requirements from .64 acres/person to .29 acres/person from 1990 to 2020 and reducing total rural land requirements from 700,000 to 320,000 acres. Infrastructure costs would be reduced from $7.7 to $6.5 billion. An appendix details ecosystem benefits of managed growth over trend projections.

5.8**Commission des communautés européènes.** *Livre vert sur l'environnement urbain: Communication de la Commission au Conseil et au Parlement*. Bruxelles, le 27 juin 1990. Cat. no. CB-CO-90-276-FR-C.

The EEC strategy for the urban environment, which recognizes the key role cities play in environmental degradation, and the unique environmental problems experienced in cities. Areas of action specified in the document are planning, urban transport, heritage protection and promotion, protection of urban natural areas, water management, urban industry, energy management, refuse, comparative data on the state of the urban environment, sensitization, social action and inter-regional co-operation. An Annex contains the articles of the EEC Treaty relating to the environment.

5.9**Davis Planning Commission**. *City of Davis General Plan. Vol. 1: Plan Policies. Vol. 2: Technical Supplement*. Davis, CA: Davis Planning Commission, December 1987.

This is a visionary plan (to 2010) for Davis, CA, a small university city in northern California. The plan is committed to retaining Davis' character as a small city surrounded by agricultural land. Cycling is recognized and promoted as a viable means of transportation, as are mass transit and walking. Affordable housing is identified as a responsibility of local government. Environmental management, including conservation, safety and noise elements, forms a major section of the plan. The fostering of environmental awareness among the citizens of Davis is recognized as a responsibility of local government. Volume 2, the technical supplement, contains an environmental impact assessment for the plan.

5.10**Editors of *Rain*.** *Knowing Home: Studies for a Possible Portland*. Portland, OR: Rain Umbrella Inc., 1981.

Portland, Oregon, in 1981, one of the 55 largest cities in the U.S., is notable for its sense of place, its livability, and environmentally friendly features such as a mass transit mall, an elected regional government, a city-wide energy conservation policy, a city housing policy and a

LRT line. This anthology, published by *Rain: A Journal of Appropriate Technology*, develops a vision of a self-reliant Portland from a bioregional perspective, integrating elements from natural, social, economic and cultural history. The authors' confidence that energy conservation, community self-help and local self-reliance would be the societal trends of the decade was not, unfortunately, borne out by the 1980s (see especially Steven Ames, "Sustainable Portland: What We Need is a City that Can Carry Us into the Next Century," pp. 37-44). Ames's enthusiasm for the comprehensive, participatory planning and "visioning" process that involved Portland planners and community groups throughout the 1970s, and his call for a sustainable city (along with a pre-Brundtland admonition to "think globally and act locally"), are only beginning to be echoed, cautiously, ten years later, in other North American cities. The outline of "Life Support" needs for Portland (energy, food/agriculture, housing, transportation, communication, arts, work/economics, emergency preparedness, waste recycling) would be a useful starting point for any city seeking sustainability.

5.11*An Environmental Handbook for Municipal Officials of Prince Edward Island*. Federation of P.E.I Municipalities, May 1988.

As the title suggests, a booklet designed to provide guidance on, and heighten awareness of, environmental matters for municipal officials. Legal and ethical responsibilities of elected officials with respect to the environment are outlined. The booklet contains an "environmental checklist" to be used by officials when considering proposed development, as well as a glossary of environmental terms and a partial list of relevant federal and provincial legislation. Environmental management and Environmental Impact Assessments are advocated.

5.12**Ernst, Marcel C.** *How to Promote, Demonstrate and Implement Sustainable Development in the N.C.C. Greenbelt and Beyond. Discussion Paper. Phase One of Future Greenbelt Project: Policy Realm.* Ottawa: Long Range Planning, Capital Planning Branch, National Capital Commission, August 1990.

This background paper provides an excellent summary and analysis of the concept of sustainable development as articulated in the Brundtland Commission Report (1987), the World Conservation Strategy (1980, 1989) and the State of the World Report (1990), and describes Canadian responses to each. The implications of these data, and of John Friedman's four forms of planning (allocative, innovative, radical and revolutionary), for the development of the National Capital Commission's Greenbelt are identified, towards a conceptual framework for decision-making. Policy implications and specific areas of intervention for the sustainable management of the Greenbelt are drawn out, in terms of: the goals of sustainable development (biophysical, socio-cultural, economic); and sustainable development strategies to be undertaken in various sectors of the Greenbelt (agricultural land, conservation areas, forest reserves, recreation/commercial areas). A thorough, thoughtful and functional work.

5.13**IBI Group and Associates.** *Greater Toronto Area Structure Concepts Study*. Toronto: Government of Ontario, Office of the Greater Toronto Area, 1990, Summary and 8 volumes.

Prepared by the consultants for the Greater Toronto Co-ordinating Committee, this study attempts to set forth the development and future cost implications of developing Toronto according to three scenarios: sprawl, a continuation of past trends into the future; concentrated; and nodal. The study found no major differences in the public capital cost of the three scenarios, although it did conclude that the

concentrated scenario resulted in the lowest private costs and involved the least environmental degradation of the three.

5.14Kanter, Ron, MPP. *Space for All: Options for a Greater Toronto Area Greenlands Strategy*. Toronto: Ontario Government Bookstore, 1990.

This report provides an excellent summary of the ways and means available in planning and in law, in Canada and other jurisdictions, for preserving green fields in support of its recommendation that a way be found to preserve the Oak Ridges Morraine, north of Toronto, from development.

5.15McGonigle, Michael. "Sustainability and Local Government: The Case of the British Columbia Islands' Trust." *Canadian Public Administration*, 32,4 (1989): 524-44.

This article describes the Islands' Trust as a potential and successful model of environmentally sustainable local administration, community-based resource management and a responsive, local democratic planning institution. Created with a mandate to protect the Gulf Islands and with the authority to make land use recommendations in consultation with the provincial government and to veto by-laws and land use contracts that violate the Trust's objective, the author describes the ways in which the Trust has systematically developed strong public support, as well as the benefits of separating the provision of planning and local services.

5.16Ottawa, City of. *City of Ottawa Official Plan: A Vision for Ottawa*. Final draft, February 1991. 3 Vols.

This Official Plan is distinctive in that it establishes "sustainable urban development" as a mission statement for the Plan, and integrates environmental policies throughout. In addition, there is an Environmental Management Chapter, regarded as a key management component in the Plan.

5.17Overtveld, J.C. *The Application of "Green Roof" Legislation to the City of Ottawa Official Plan*. Ottawa: University of Ottawa, Faculty of Law, April 1990.

This very interesting report explores the possibility of implementing a "Green Roof" strategy for inner city Ottawa, modelled on a similar scheme undertaken in Mannheim, Germany. In Mannheim, a by-law was passed requiring citizens and developers to plant rooftop greenery (e.g., grass, vines, plants, shrubs, trees) on most new and renovated buildings. The German by-law also specifies amounts of greenery to be integrated into lawns and parking lots, and violations can incur a costly fine (approximately $13,000 Cdn.). The environmental benefits that such a policy would bring to Ottawa include better stormwater runoff; amelioration of air pollution, heat, wind and noise; and enhanced energy efficiency. In addition, a "green roof" policy would reinforce Ottawa's image as a "green city." Such a policy would be in line with Ottawa's *Planning Act*, which incorporates sustainable development principles, and could be implemented by means of Ottawa's bonus zoning provision.

5.18Peterborough, City of. *Peterborough's Agenda for Sustainable Development*. Peterborough, ON: City of Peterborough, 1991.

Considered to represent some of the most advanced Canadian empirical understanding of the agenda implicated by sustainable development, this report contains sections on land use and local transportation, ecological protection of natural areas, water management, energy conservation and waste management.

5.19Peterborough Committee on Sustainable Development. *Sustainable Development and The Official Plan of the City of Peterborough*.

Peterborough, ON: City Clerk, February 1991.

An example of the range of issues and policies that may be addressed under Ontario's planning legislation, this short report by the Committee outlines a comprehensive range of actions for consideration by municipal Council that extends to bioregional and ecological concerns, as well as those related more directly to environmental conservation.

5.20**Pollution Probe.** *The Canadian Green Consumer Guide*. 2nd ed. Toronto: McClelland and Stewart, 1991.

Organized into ten sections—costing the earth, food and drink, cleaners, clothing and toiletries, the home, gardening, waste management, transportation, working and investing and travel and leisure—this Green Directory not only guides the consumer to "green" products and services, it also contains data and descriptions regarding the impact of ordinary consumption on the environment and how altering consumption patterns and habits may reduce environmental harm. Indexes contain addresses of companies meeting Pollution Probe's "green" criteria and of federal and provincial government agencies responsible for the environment and for natural resources.

5.21**Reeve, Noella.** "Sustainable Development in Municipalities: Making it Work." Vancouver: Forum for Planning Action, Discussion Paper, September 1989.

This short discussion paper prepared for a community-based organization provides an excellent summary of what constitutes sustainable development, examples of it and the ways and means that it can be encouraged by citizens in the municipal context.

5.22**Register, Richard.** *Ecocity Berkeley: Building Cities for a Healthy Future*. Berkeley: North Atlantic Books, 1987.

The author's purpose is to present the concept of "ecocities," to suggest ways for people to take part in transforming their existing towns and cities into ecocities, and to propose changes in one particular city, Berkeley, CA. In Part I, the author defines and introduces the concept of "ecocity," and then elaborates the changes which the concept implies for planning, architecture and urban policy. An ecocity is defined as an ecologically healthy city. The ecocity is the domain of what the author labels, "bioregionalists," practitioners who over the past decade have pointed out the value of learning about the places in which we live and alerted people to the extent of their impacts on nature. The author then moves on to illustrate the principles for rebuilding our cities to fit gracefully and even regeneratively into their bioregions. The section on Berkeley, Part II of the book, applies the ideas on changes in planning, architecture, policy and citizen action developed in Part I to one particular city, although the author is careful to caution the reader that application to other cities, while similar in principle, will vary with each city's special circumstances. The book concludes with references to resources, international and general, useful for moving our cities in the direction of ecocities, as well as a bibliography of useful readings on the subject.

5.23**Sanderson, Kim.** *Exploring Municipal Options for a Greener Alberta*. Edmonton: Environment Council of Alberta, 1988.

This report comprises a very easy to read guideline to conserving natural features and reducing energy use in municipalities. Topics covered include tree planting in private yards (potential reduction in air-conditioning requirements of 24-29% and in annual hydro requirements of 8-14%), landscaping road verges, reducing auto dependence and promoting alternative means of transportation (full-cost pricing of gasoline would result in price of $1.37/litre), residential water conservation

(retrofitting of 8 houses in Palliser resulted in saving of 31% and waste- and storm-water storage and irrigation).

5.24Sudbury, City of. *Planning for Sustainable Development: The Sudbury Case*. Strategic/Corporate Plan of/by/for the City of Sudbury: The Compendium of Word Slides, n.d.

This document, consisting of the word slides from a synchronized audio-visual presentation, introduces and defines the concept of sustainable development in an urban context, as developed in the Strategic/Corporate Plan of the City of Sudbury. A paradigm shift from conventional planning to more sustainable planning practices is advocated.

5.25Toronto, City of, The Task Force to Bring Back the Don. *Bringing Back the Don*. Toronto: Office of the City Clerk, August 1991.

While the initiative and responsibility for this report lies with this City of Toronto Task Force, the report also embodies the contributions of numerous consultants, including Michael Hough, project director, and David Gordon, planner, both noted Canadian environmentalists. The authors commence by establishing the environmental context in the Greater Toronto bio-region and the ecosystems view. They then go to a description of the hydrology of the Don River, including the fact that separated storm sewers outside the City of Toronto and Borough of East York are the primary source of contaminants. The combined sewers in the City of Toronto and Borough of East York are estimated to be responsible for approximately 5% of the pollutants at the mouth. Proposals designed to supplement the separation of sanitary and storm sewers already underway include the enhancement of the river mouth with the creation of a delta and marsh, the creation of an aquatic habitat in new marshes and restoration of terrestrial habitats. Improvements that would benefit water quality are projected to cost $58 million, which, when added to the estimated $160 million cost of separating storm and sanitary sewers, would bring the total cost of improvements to the Don sewershed to $218 million.

5.26Toronto, Municipality of Metropolitan, Planning Department. *The GTA: Concepts for the Future*. Toronto: Metropolitan Planning Department, 1991.

This volume comprises the essential framework and strategy document for the regional municipality's quinquennial planning review. Five alternative urban structures/forms are outlined for the future: sprawl (continuation of past trends); fingers; deconcentrated centres; concentration; and re-investment centres. Only the last two support what is termed option three for the natural environment. Option three places high priority on the preservation of natural resources and would protect key geographical features, including agricultural land in classes 1-3, from future development.

5.27Van der Ryn, Sim and Peter Calthorpe. *Sustainable Communities: A New Design Synthesis for Cities, Suburbs, and Towns*. San Francisco: Sierra Club, 1986.

One of the first books to be published on the theme of sustainable human settlements, this collection of papers grew out of an interdisciplinary design workshop held near Sonoma, CA in 1980. Part One contains case studies of sustainable development in U.S. cities and suburbs, both actual (urban neighbourhood revitalization in Sacramento and Philadelphia) and proposed (Sunnyvale, CA, Marin Solar Village, Golden, CO). Part Two consists of essays on topics related to urban sustainability: economic and social change ("The Mass and Information Economy" by Paul Hawken, "Design as if People Mattered" by Clare

Cooper-Marcus); the principle of self-reliance ("Local Self-Reliance" by David Morris); built environments designed on biological principles ("Architecture and Biology" by John Todd); urban agriculture ("Metropolitan Food Systems and the Sustainable City" by David Katz); (more) sustainable urban transportation ("Real Possibilities in the Transportation Myths" by Fred Reid); and the implications of the twentieth century "New Towns" for sustainable urban planning ("A Short History of Twentieth Century New Towns" by Peter Calthorpe). A distinctive feature of this book is its emphasis on the suburb, perhaps attributable to its U.S. focus.

5.28**World Conservation Union, United Nations Environment Programme, World Wild Fund for Nature.** *Caring for the Earth: A Strategy for Sustainable Living*. Gland, Switzerland: October 1991.

Following its 1980 publication of the *World Conservation Strategy*, this publication, undoubtedly one of the most comprehensive available, is intended to update the principles and recommended actions to reflect the significant contributions towards the group's objectives in the 1980s, as well as to guide future national action and international co-operation for environmentally sound development in 1992 and beyond. Two objectives are developed in detail: to translate principles for sustainable living into guidelines for practice and to provide a guide for the integration of conservation and development. Principles for sustainable development, as well as activities that will give substance to these principles, are defined in Part 1. Part 2 describes corresponding actions that are required in relation to the main areas of human activity. Part 3 contains a listing of all the recommended priority actions.

6 Sustainable Communities

6.1**Andruss, Van, Christopher Plant, Judith Plant and Eleanor Wright.** *Home! A Bioregional Reader*. Philadelphia/Santa Cruz/Gabriola Island, BC: New Society Publications, 1990.

This sampler of bioregional thought contains excerpts from a variety of bioregionalist and related writings, organized under the following headings: What is Bioregionalism?; Living in Place; Nature, Culture and Community; Reinhabitation and Restoration; and Self-Government. Bioregionalism advocates living/staying in place ("home"), *local*, ecologically and culturally appropriate, small-scale economic activity and self-government, community, co-operation, equity and spirituality; affinities with ecofeminism and Native values are apparent. A good introduction to the bioregionalist perspective—an environmental philosophy with implications for urban and community planning.

6.2**British Columbia Round Table on the Environment and the Economy**. *Sustainable Communities*. Victoria, n.d.

Contains recommendations on how to achieve sustainable communities based on the "environmental values" of ecological limitations, economic viability and social equity. Special attention is given to the issues of air quality, land use, water quality and waste management. Contact: British Columbia Round Table on the Environment and the Economy, Suite 229, 560 Johnson Street, Victoria, British Columbia V8W 3C6.

6.3**Davidson, Joan.** *How Green Is Your City? Pioneering Approaches to Environmental Action*. London: Bedford Square Press, 1988.

A sampler of environmentally friendly, neighbourhood self-help projects in various

British cities. Case studies of projects embodying city greening, energy conservation and waste recycling are featured. The book assumes a British readership, and makes frequent reference to U.K. agencies, programs and policies, which North American readers may find bewildering. However, many of the case studies, and much of the practical advice on start-up and management, could be adapted to other localities and institutional frameworks.

6.4 **Gardner, Julia and Mark Roseland.** "Acting Locally/Community Strategies for Equitable Sustainable Development." *Alternatives*, 16,3 (October/November 1989): 36-48.

The authors argue in favour of co-management schemes, where government maintains jurisdiction over resources and user groups enter into agreements covering their management. Native self-government and community land trusts are used as two examples of co-management.

6.5 **Global Cities Project.** *Building Sustainable Communities: An Environmental Guide for Local Government*. 12 Volumes. San Francisco: Centre for Study of Law and Politics, 1991.

An invaluable resource for both local governments and citizens' groups advocating sustainable development policies and environmental conservation and degradation mitigation, each of the 12 volumes consists of an introduction to the subject of the volume and its place in a green city program, facts about the significance of that subject, examples of local government actions taken in one or more cities that might be taken in others, a bibliography, generally for the period 1985-1989, and a listing of organizations that are available as resources. The following subjects are covered:

1. Water: Conservation and Reclamation;
2. Solid Waste: Reduction, Reuse and Recycling;
3. Toxics: Management and Reduction;
4. Transportation: Efficiency and Alternatives;
5. Open Space: Preservation and Acquisition;
6. Energy: Efficiency and Production;
7. Urban Forestry, Land Use: Stewardship and the Planning Process;
8. Greenhouse Gases: Reduction and Ozone Protection;
9. Air Quality: Pollution Prevention and Mitigation;
10. Water Quality: Pollution Prevention and Mitigation;
11. Environmental Management: Making Your Policies Stick; and
12. Interlocal Co-operation on Environmental Issues.

6.6 **Hancock, Trevor.** "Towards Healthy and Sustainable Communities: Health, Environment and Economy at the Local Level." A presentation to the Third Colloquium on Environmental Health, Quebec, November 22, 1990.

Hancock discusses the features which the Healthy Communities and sustainable cities movements have in common, and how the two have complementary aspects. A healthy community is: economically prosperous; biologically viable; communally convivial; environmentally sustainable; socially equitable; and urbanely livable (p. 13). Like many of the other authors cited in this bibliography, Hancock holds that sustainable development is a largely a matter of implementing what we already know, which requires political will. He recommends that cities develop contingency plans to deal with the environmental degradation that is now inevitable.

6.7 **House, J.D.** "Towards Sustainable Native Communities: Lessons from Newfoundland Outports." In Paul Kariya, ed., *Native Socio-Economic Development in Canada: Change, Promise and Innovation*. Native Issues 2. Winnipeg: Institute of Urban Studies, 1989, pp.

47-60.

The author, a professor at Memorial University, adapts principles for sustainable local development from isolated Newfoundland communities to the similar situation of remote Native settlements. Sustainable housing, household production, income security, employment creation, entrepreneurial spirit, technology/organization, communications/transportation, schooling, local government/development organizations and ecology are discussed. According to House, the sustainable community "sustain[s] balanced relationships with nature and with other communities; . . . enjoy[s] all the amenities of a modern life-style, including sophisticated and up-to-date technologies and communications systems; . . . citizens are fully employed in a combination of market and non-market economic activities; and their quality of life ad psychological well-being are of a high order" (p. 48).

6.8Naess, Arne. *Ecology, Community and Lifestyle*. Translated and edited by David Rothenberg. Cambridge: University Press, 1989.

This is a revision and translation of Naess's 1976 work *Økologi, samfunn, og livsstil*. The author is the Norwegian philosopher who pioneered the environmental perspective known as "deep ecology." This book is a philosophical justification of deep ecology, and it is a much more profound, rational and thoughtful treatment than the many popularizations currently available, surprisingly open to the insights of other schools of environmental thinking. Although the topic of urbanization is not specifically addressed, Naess's ideas on community-building and (non-violent) social action are worth considering (note especially the characteristics of "green communities" summarized on pp. 144-46, and the norms for non-violent action articulated on pp. 148-50). For readers who want an accurate understanding of the basics of deep ecology and its implications for community planning, this book is a must.

6.9"Planning Sustainable Communities." In William E. Rees, gen. ed., *Planning for Sustainable Development: A Resource Book*. Vancouver: University of British Columbia Centre for Human Settlements. 1989, pp. 49-62.

This is a chapter in the proceedings of a symposium on planning for sustainable development held at the University of British Columbia in November 1988. The chapter falls into three main parts: 1. a three-page discussion of "What Makes a Community Sustainable"; 2. a summary, presented in point form, of the discussion at the two Sustainable Communities workshops held at the symposium; and 3. workshop recommendations presented to the symposium plenary session, again in point form. The idea of planning for sustainable communities is analyzed in terms of substantive issues (e.g., attitude change, economic issues, ecological issues), procedural issues (e.g., a systemic or holistic approach is recommended), and institutional issues (change must come from the roots up). This may serve as a useful "grab bag" of ideas and definitions, more or less original, for planners interested in sustainable communities. Especially interesting is the 12-point definition of a sustainable community on pages 57-58. See also the "Statements from Participants" on pp. 122-31.

7 Periodicals

7.1 *ASC (Affordable Sustainable Community) News*. Centre for Livable Communities, Faculty of Environmental Design, University of Calgary.

Established in 1991, the Centre will focus initially on the development of a sustainable urban development near downtown Calgary, and the quarterly newsletter will provide a vehicle for monitoring progress in the design and development of the proposed community.

7.2 *Bamberton News*. South Island, Suite 550, 2950 Douglas St., Victoria, BC V8T 4N4.

Bamberton is a proposed new town, near Victoria, to be built over 20 years on the site of an old cement works. The town will realize ecological sustainability, community values and traditional village-style neighbourhoods. The 8-page newsletter reports on the progress of the proposed development, as well as on larger environmental issues.

7.3 *Climatic Change*. Boston: Kluwer Academic Publishers.

An interdisciplinary journal devoted to the description, causes and implications of climatic change. No. 15.1-2, October 1989, is special issue devoted to greenhouse gas emissions, environmental consequences and policy responses.

7.4 *Environment and Development*. Washington, DC: American Planning Association.

Initiated in January 1992, this monthly newsletter is intended to guide American urban and community planners in translating global environmental concerns into effective development techniques. It is also intended to provide a timely guide to shifts in environmental policy.

7.5 *Environment and Urbanization*. International Institute for Environment and Development.

This biannual journal began publication in 1989, and each issue is on a special theme related to environment and urbanization in the Third World. Theme issues published to date are: Environmental Problems in Third World Cities; Beyond the Stereotype of Slums: How Poor People Find Accommodation in Cities; Community Organizations: How They Develop, What They Seek, What They Achieve; Children and the Environment: Their Needs, Perceptions and Problems; Rethinking Local Government: Views from the Third World. The next issue (3,2 [1991]) will be on the theme of: Women in Environment and Urbanization: Strategies for Action and the Potential for Change. Subscriptions and back issues are available from: *Environment and Urbanization*, International Institute for Environment and Development, 3 Endsleigh Street, London WC1H 0DD, U.K.

7.6 *The New Catalyst*. P.O. Box 189, Gabriola Island, BC V0R 1X0.

This quarterly tabloid-style newspaper, published by the New Catalyst Education Society, covers Western Canadian environmental issues, including urban and community development issues, from a bioregional perspective.

7.7 *New Planning News*. Commission on Planning and Development Reform in Ontario.

Scheduled to exist only as long as the Royal Commission, this tabloid-style periodical nevertheless provides a guide to state of the art thinking on the relationship between planning and sustainable development in urban Canada.

7.8 *The Urban Ecologist*. P.O. Box 10144, Berkeley, CA 94709, U.S.A.

This quarterly newsletter is published by

Urban Ecology, an environmental network based in Berkeley, California, dedicated to promoting the concept of the ecocity—especially to ecologically informed urban design. Each issue contains reports and articles on a range of urban environmental issues and initiatives. Brief reports on "sustainable city" reforms and programs in the Bay Area, the U.S. and internationally are a regular feature, as are conference reports. Sample copies may be obtained from the publishers. A subscription accompanies membership in Urban Ecology ($25.00 U.S. minimum).

7.9 *Urban Ecology*. Elsevier Holland, 1976-1985.

Urban Ecology was an international quarterly journal sponsored by the International Association for Ecology, published by Elsevier Holland from 1976 to 1985. The focus of the journal was on "ecological processes and interactions within urban areas and between human settlements and the surrounding natural systems which support them." Analyses of urban systems and their components, and of the species which inhabit cities, fall within the scope of the journal. Assessments of human health and well-being were of special interest. The journal was designed to appeal to a wide, multi-disciplinary range of academics and professionals. A sample table of contents (9,2 [1985]) indicates the range of topics covered by articles: "Nature Conservation, Water and Urban Areas in Britain" by J.G. Kelcey; "A Quantitative Analysis of the Flora and Plant Communities of a Representative Midwestern U.S. Town" by G.G. Whitney; "Weed Synecology and Dynamics in Urban Environment" by G. Vincent and Y. Bergeron; "Human Ecology for Land Use Planning" by J.B. Jackson and F.R. Steiner; "What Drives People to Drink? Interpreting the Effect of Urban Living on the Use and Abuse of Alcohol" by C.J. Smith.

7.10 *Sustainable Cities*. Institute of Urban Studies, University of Winnipeg.

First published in December 1991, this special supplement to the Institute's quarterly *Newsletter* is intended to allow readers to monitor its research program in the area of sustainable urban development, as well as significant events in the program area.

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